



CALL NO. 106

CONTRACT ID. 151085

CAMPBELL COUNTY

FED/STATE PROJECT NUMBER HPP 0166(007)

DESCRIPTION AA HIGHWAY TO I-275 CONNECTOR

WORK TYPE GRADE & DRAIN WITH ASPHALT SURFACE

PRIMARY COMPLETION DATE 11/1/2017

LETTING DATE: December 11,2015

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN STANDARD TIME December 11,2015. Bids will be publicly announced at 10:00 AM EASTERN STANDARD TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 5%

REQUIRED BID PROPOSAL GUARANTY: Not less than 5% of the total bid.

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PART I
SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 06

CONTRACT ID - 151085
HPP 0166(007)
COUNTY - CAMPBELL
PCN - DE0190NEW1585
HPP 0166(007)

AA HIGHWAY TO I-275 CONNECTOR CONSTRUCT NEW CONNECTOR ROAD FROM JUST SOUTH OF JOHN'S HILL ROAD(KY-2345) TO THREE MILE ROAD(KY-2238) NEAR THE I-275 INTERCHANGE.GRADE & DRAIN WITH ASPHALT SURFACE SYP NO. 06-08105.05.
GEOGRAPHIC COORDINATES LATITUDE 39:02:03.00 LONGITUDE 84:28:05.00

COMPLETION DATE(S):
COMPLETED BY 11/01/2017 APPLIES TO ENTIRE CONTRACT

CONTRACT NOTES

PROPOSAL ADDENDA

All addenda to this proposal must be applied when calculating bid and certified in the bid packet submitted to the Kentucky Department of Highways. Failure to use the correct and most recent addenda may result in the bid being rejected.

BID SUBMITTAL

Bidder must use the Department's Expedite Bidding Program available on the Internet web site of the Department of Highways, Division of Construction Procurement. (www.transportation.ky.gov/construction-procurement)

The Bidder must download the bid file located on the Bid Express website (www.bidx.com) to prepare a bid packet for submission to the Department. The bidder must submit electronically using Bid Express.

JOINT VENTURE BIDDING

Joint venture bidding is permissible. All companies in the joint venture must be prequalified in one of the work types in the Qualifications for Bidders for the project. The bidders must get a vendor ID for the joint venture from the Division of Construction Procurement and register the joint venture as a bidder on the project. Also, the joint venture must obtain a digital ID from Bid Express to submit a bid. A joint bid bond of 5% may be submitted for both companies or each company may submit a separate bond of 5%.

UNDERGROUND FACILITY DAMAGE PROTECTION

The contractor is advised that the Underground Facility Damage Protection Act of 1994, became law January 1, 1995. It is the contractor's responsibility to determine the impact of the act regarding this project, and take all steps necessary to be in compliance with the provision of the act.

SPECIAL NOTE FOR COMPOSITE OFFSET BLOCKS

Contrary to the Standard Drawings (2012 edition) the Cabinet will allow 6" composite offset blocks in lieu of wooden offset blocks, except as specified on proprietary end treatments and crash cushions. The composite blocks shall be selected from the Cabinet's List of Approved Materials.

REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY

Pursuant to KRS 176.085(1)(b), an agency, department, office, or political subdivision of the Commonwealth of Kentucky shall not award a state contract to a person that is a foreign entity required by [KRS 14A.9-010](#) to obtain a certificate of authority to transact business in the Commonwealth (“certificate”) from the Secretary of State under [KRS 14A.9-030](#) unless the person produces the certificate within fourteen (14) days of the bid or proposal opening. If the foreign entity is not required to obtain a certificate as provided in [KRS 14A.9-010](#), the foreign entity should identify the applicable exception. Foreign entity is defined within [KRS 14A.1-070](#).

For all foreign entities required to obtain a certificate of authority to transact business in the Commonwealth, if a copy of the certificate is not received by the contracting agency within the time frame identified above, the foreign entity’s solicitation response shall be deemed non-responsive or the awarded contract shall be cancelled.

Businesses can register with the Secretary of State at <https://secure.kentucky.gov/sos/ftbr/welcome.aspx>.

SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT

Questions about projects during the advertisement should be submitted in writing to the Division of Construction Procurement. This may be done by fax (502) 564-7299 or email to kytc.projectquestions@ky.gov. The Department will attempt to answer all submitted questions. The Department reserves the right not to answer if the question is not pertinent or does not aid in clarifying the project intent.

The deadline for posting answers will be 3:00 pm Eastern Daylight Time, the day preceding the Letting. Questions may be submitted until this deadline with the understanding that the later a question is submitted, the less likely an answer will be able to be provided.

The questions and answers will be posted for each Letting under the heading “Questions & Answers” on the Construction Procurement website (www.transportation.ky.gov/contract). The answers provided shall be considered part of this Special Note and, in case of a discrepancy, will govern over all other bidding documents.

HARDWOOD REMOVAL RESTRICTIONS

The US Department of Agriculture has imposed a quarantine in Kentucky and several surrounding states, to prevent the spread of an invasive insect, the emerald ash borer.

Hardwood cut in conjunction with the project may not be removed from the state. Chipping or burning on site is the preferred method of disposal.

INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES

Identification of excess material sites and borrow sites shall be the responsibility of the Contractor. The Contractor shall be responsible for compliance with all applicable state and federal laws and may wish to consult with the US Fish and Wildlife Service to seek protection under Section 10 of the Endangered Species Act for these activities.

ACCESS TO RECORDS

The contractor, as defined in KRS 45A.030 (9) agrees that the contracting agency, the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review. Records and other prequalification information confidentially disclosed as part of the bid process shall not be deemed as directly pertinent to the contract and shall be exempt from disclosure as provided in KRS 61.878(1)(c). The contractor also recognizes that any books, documents, papers, records, or other evidence, received during a financial audit or program review shall be subject to the Kentucky Open Records Act, KRS 61.870 to 61.884.

In the event of a dispute between the contractor and the contracting agency, Attorney General, or the Auditor of Public Accounts over documents that are eligible for production and review, the Finance and Administration Cabinet shall review the dispute and issue a determination, in accordance with Secretary's Order 11-004. (See attachment)

10/29/12



Steven L. Beshear
Governor

Commonwealth of Kentucky
Finance and Administration Cabinet
OFFICE OF THE SECRETARY
Room 383, Capitol Annex
702 Capital Avenue
Frankfort, KY 40601-3462
(502) 564-4240
Fax (502) 564-6785

Lori H. Flanery
Secretary

SECRETARY'S ORDER 11-004

FINANCE AND ADMINISTRATION CABINET

Vendor Document Disclosure

WHEREAS, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary to conduct a review of the records of a private vendor that holds a contract to provide goods and/or services to the Commonwealth; and

WHEREAS, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary during the course of an audit, investigation or any other inquiry by an Executive Branch agency that involves the review of documents; and

WHEREAS, KRS 42.014 and KRS 12.270 authorizes the Secretary of the Finance and Administration Cabinet to establish the internal organization and assignment of functions which are not established by statute relating to the Finance and Administration Cabinet; further, KRS Chapter 45A.050 and 45A.230 authorizes the Secretary of the Finance and Administration Cabinet to procure, manage and control all supplies and services that are procured by the Commonwealth and to intervene in controversies among vendors and state agencies; and

NOW, THEREFORE, pursuant to the authority vested in me by KRS 42.014, KRS 12.270, KRS 45A.050, and 45A.230, I, Lori H. Flanery, Secretary of the Finance and Administration Cabinet, do hereby order and direct the following:

- I. Upon the request of an Executive Branch agency, the Finance and Administration Cabinet ("FAC") shall formally review any dispute arising where the agency has requested documents from a private vendor that holds a state contract and the vendor has refused access to said documents under a claim that said documents are not directly pertinent or relevant to the agency's inquiry upon which the document request was predicated.
- II. Upon the request of an Executive Branch agency, the FAC shall formally review any situation where the agency has requested documents that the agency deems necessary to

conduct audits, investigations or any other formal inquiry where a dispute has arisen as to what documents are necessary to conclude the inquiry.

- III. Upon receipt of a request by a state agency pursuant to Sections I & II, the FAC shall consider the request from the Executive Branch agency and the position of the vendor or party opposing the disclosure of the documents, applying any and all relevant law to the facts and circumstances of the matter in controversy. After FAC's review is complete, FAC shall issue a Determination which sets out FAC's position as to what documents and/or records, if any, should be disclosed to the requesting agency. The Determination shall be issued within 30 days of receipt of the request from the agency. This time period may be extended for good cause.
- IV. If the Determination concludes that documents are being wrongfully withheld by the private vendor or other party opposing the disclosure from the state agency, the private vendor shall immediately comply with the FAC's Determination. Should the private vendor or other party refuse to comply with FAC's Determination, then the FAC, in concert with the requesting agency, shall effectuate any and all options that it possesses to obtain the documents in question, including, but not limited to, jointly initiating an action in the appropriate court for relief.
- V. Any provisions of any prior Order that conflicts with the provisions of this Order shall be deemed null and void.

FEDERAL CONTRACT NOTES

The Kentucky Department of Highways, in accordance with the Regulations of the United States Department of Transportation 23 CFR 635.112 (h), hereby notifies all bidders that failure by a bidder to comply with all applicable sections of the current Kentucky Standard Specifications, including, but not limited to the following, may result in a bid not being considered responsive and thus not eligible to be considered for award:

102.02 Current Capacity Rating 102.10 Delivery of Proposals
102.08 Irregular Proposals 102.14 Disqualification of Bidders
102.09 Proposal Guaranty

CIVIL RIGHTS ACT OF 1964

The Kentucky Department of Highways, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the Federal Department of Transportation (49 C.F.R., Part 21), issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin.

NOTICE TO ALL BIDDERS

To report bid rigging activities call: 1-800-424-9071.

The U.S. Department of Transportation (DOT) operates the above toll-free “hotline” Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the “hotline” to report such activities.

The “hotline” is part of the DOT’s continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

SECOND TIER SUBCONTRACTS

Second Tier subcontracts on federally assisted projects shall be permitted. However, in the case of DBE’s, second tier subcontracts will only be permitted where the other subcontractor is also a DBE. All second tier subcontracts shall have the consent of both the Contractor and the Engineer.

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

It is the policy of the Kentucky Transportation Cabinet (“the Cabinet”) that Disadvantaged Business Enterprises (“DBE”) shall have the opportunity to participate in the performance of highway construction projects financed in whole or in part by Federal Funds in order to create a level playing field for all businesses who wish to contract with the Cabinet. To that end, the Cabinet will comply with the regulations found in 49 CFR Part 26, and the definitions and requirements contained therein shall be adopted as if set out verbatim herein.

The Cabinet, contractors, subcontractors, and sub-recipients shall not discriminate on the basis of race, color, national origin, or sex in the performance of work performed pursuant to Cabinet contracts. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted highway construction projects. The contractor will include this provision in all its subcontracts and supply agreements pertaining to contracts with the Cabinet.

Failure by the contractor to carry out these requirements is a material breach of its contract with the Cabinet, which may result in the termination of the contract or such other remedy as the Cabinet deems necessary.

DBE GOAL

The Disadvantaged Business Enterprise (DBE) goal established for this contract, as listed on the front page of the proposal, is the percentage of the total value of the contract.

The contractor shall exercise all necessary and reasonable steps to ensure that Disadvantaged Business Enterprises participate in a least the percent of the contract as set forth above as goals for this contract.

OBLIGATION OF CONTRACTORS

Each contractor prequalified to perform work on Cabinet projects shall designate and make known to the Cabinet a liaison officer who is assigned the responsibility of effectively administering and promoting an active program for utilization of DBEs.

If a formal goal has not been designated for the contract, all contractors are encouraged to consider DBEs for subcontract work as well as for the supply of material and services needed to perform this work.

Contractors are encouraged to use the services of banks owned and controlled by minorities and women.

CERTIFICATION OF CONTRACT GOAL

Contractors shall include the following certification in bids for projects for which a DBE goal has been established. BIDS SUBMITTED WHICH DO NOT INCLUDE CERTIFICATION OF DBE PARTICIPATION WILL NOT BE ACCEPTED. These bids will not be considered for award by the Cabinet and they will be returned to the bidder.

“The bidder certifies that it has secured participation by Disadvantaged Business Enterprises (“DBE”) in the amount of ____ percent of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program.”

The certification statement is located in the electronic bid file. All contractors must certify their DBE participation on that page. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted.

DBE PARTICIPATION PLAN

Lowest responsive bidders must submit the *DBE Plan/ Subcontractor Request*, form TC 14-35 DBE, within 7 days of the letting. This is necessary before the Awards Committee will review and make a recommendation. **The project will not be considered for award prior to submission and approval of the apparent low bidder’s DBE Plan/Subcontractor Request.**

The DBE Participation Plan shall include the following:

- 1 Name and address of DBE Subcontractor(s) and/or supplier(s) intended to be used in the proposed project;
- 2 Description of the work each is to perform including the work item , unit, quantity, unit price and total amount of the work to be performed by the individual DBE. The Project Code Number (PCN), Category Number, and the Project Line Number can be found in the “material listing” on the Construction Procurement website under the specific letting;
- 3 The dollar value of each proposed DBE subcontract and the percentage of total project contract value this represents. DBE participation may be counted as follows; a) If DBE suppliers and manufactures assume actual and contractual responsibility, the dollar value of materials to be furnished will be counted toward the goal as follows:
 - The entire expenditure paid to a DBE manufacturer;
 - 60 percent of expenditures to DBE suppliers that are not manufacturers provided the supplier is a regular dealer in the product involved. A regular dealer must be engaged in, as its principal business and in its own name, the sale of products to

- the public, maintain an inventory and own and operate distribution equipment;
and
- The amount of fees or commissions charged by the DBE firms for a bona fide service, such as professional, technical, consultant, or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials, supplies, delivery of materials and supplies or for furnishing bonds, or insurance, providing such fees or commissions are determined to be reasonable and customary.
- b) The dollar value of services provided by DBEs such as quality control testing, equipment repair and maintenance, engineering, staking, etc.;
- c) The dollar value of joint ventures. DBE credit for joint ventures will be limited to the dollar amount of the work actually performed by the DBE in the joint venture;
- 4 Written and signed documentation of the bidder's commitment to use a DBE contractor whose participation is being utilized to meet the DBE goal; and
- 5 Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment.

UPON AWARD AND BEFORE A WORK ORDER WILL BE ISSUED

Contractors must submit the signed subcontract between the contractor and the DBE contractor, the DBE's certificate of insurance, and an affidavit for bidders, offerors, and contractors from the DBE to the Division of Construction Procurement. The affidavit can be found on the Construction Procurement website. If the DBE is a supplier of materials for the project, a signed purchase order and an affidavit for bidders, offerors, and contractors must be submitted to the Division of Construction Procurement.

Changes to DBE Participation Plans must be approved by the Cabinet. The Cabinet may consider extenuating circumstances including, but not limited to, changes in the nature or scope of the project, the inability or unwillingness of a DBE to perform the work in accordance with the bid, and/or other circumstances beyond the control of the prime contractor.

CONSIDERATION OF GOOD FAITH EFFORTS REQUESTS

If the DBE participation submitted in the bid by the apparent lowest responsive bidder does not meet or exceed the DBE contract goal, the apparent lowest responsive bidder must submit a Good Faith Effort Package to satisfy the Cabinet that sufficient good faith efforts were made to meet the contract goals prior to submission of the bid. Efforts to increase the goal after bid submission will not be considered in justifying the good faith effort, unless the contractor can show that the proposed DBE was solicited prior to the letting date. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted. One complete set and nine (9) copies of this information must be received in the

office of the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

Where the information submitted includes repetitious solicitation letters it will be acceptable to submit a sample representative letter along with a distribution list of the firms solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal as necessary to demonstrate compliance with the factors listed below which the Cabinet considers in judging good faith efforts. This documentation may include written subcontractors' quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

The Good Faith Effort Package shall include, but may not be limited to information showing evidence of the following:

- 1 Whether the bidder attended any pre-bid meetings that were scheduled by the Cabinet to inform DBEs of subcontracting opportunities;
- 2 Whether the bidder provided solicitations through all reasonable and available means;
- 3 Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting who are prequalified in the areas of work that the bidder will be subcontracting;
- 4 Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are prequalified in the subcontracted areas, the bidder must notify the DBE Liaison in the Office of Minority Affairs to give notification of the bidder's inability to get DBE quotes;
- 5 Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise perform these work items with its own forces;
- 6 Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract;
- 7 Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached;
- 8 Whether quotations were received from interested DBE firms but were rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firm's quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE goals;
- 9 Whether the bidder specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be subcontracted includes potential DBE participation;
- 10 Whether the bidder made any efforts and/or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the

work requirements of the bid proposal; and

11 Any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include DBE participation.

FAILURE TO MEET GOOD FAITH REQUIREMENT

Where the apparent lowest responsive bidder fails to submit sufficient participation by DBE firms to meet the contract goal and upon a determination by the Good Faith Committee based upon the information submitted that the apparent lowest responsive bidder failed to make sufficient reasonable efforts to meet the contract goal, the bidder will be offered the opportunity to meet in person for administrative reconsideration. The bidder will be notified of the Committee's decision within 24 hours of its decision. The bidder will have 24 hours to request reconsideration of the Committee's decision. The reconsideration meeting will be held within two days of the receipt of a request by the bidder for reconsideration.

The request for reconsideration will be heard by the Office of the Secretary. The bidder will have the opportunity to present written documentation or argument concerning the issue of whether it met the goal or made an adequate good faith effort. The bidder will receive a written decision on the reconsideration explaining the basis for the finding that the bidder did or did not meet the goal or made adequate Good Faith efforts to do so.

The result of the reconsideration process is not administratively appealable to the Cabinet or to the United States Department of Transportation.

The Cabinet reserves the right to award the contract to the next lowest responsive bidder or to rebid the contract in the event that the contract is not awarded to the low bidder as the result of a failure to meet the good faith requirement.

SANCTIONS FOR FAILURE TO MEET DBE REQUIREMENTS OF THE PROJECT

Failure by the prime contractor to fulfill the DBE requirements of a project under contract or to demonstrate good faith efforts to meet the goal constitutes a breach of contract. When this occurs, the Cabinet will hold the prime contractor accountable, as would be the case with all other contract provisions. Therefore, the contractor's failure to carry out the DBE contract requirements shall constitute a breach of contract and as such the Cabinet reserves the right to exercise all administrative remedies at its disposal including, but not limited to the following:

- Disallow credit toward the DBE goal;
- Withholding progress payments;
- Withholding payment to the prime in an amount equal to the unmet portion of the contract goal; and/or
- Termination of the contract.

PROMPT PAYMENT

The prime contractor will be required to pay the DBE within seven (7) working days after he or she has received payment from the Kentucky Transportation Cabinet for work performed or materials furnished.

CONTRACTOR REPORTING

All contractors must keep detailed records and provide reports to the Cabinet on their progress in meeting the DBE requirement on any highway contract. These records may include, but shall not be limited to payroll, lease agreements, cancelled payroll checks, executed subcontracting agreements, etc. Prime contractors will be required to submit certified reports on monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal. These reports must be submitted within 14 days of payment made to the DBE contractor.

Payment information that needs to be reported includes date the payment is sent to the DBE, check number, Contract ID, amount of payment and the check date. Before Final Payment is made on this contract, the Prime Contractor will certify that all payments were made to the DBE subcontractor and/or DBE suppliers.

The Prime Contractor should supply the payment information at the time the DBE is compensated for their work. Form to use is located at:

<http://transportation.ky.gov/Construction/Pages/Subcontracts.aspx>

The prime contractor should notify the KYTC Office of Civil Rights and Small Business Development seven (7) days prior to DBE contractors commencing work on the project. The contact is Melvin Bynes and the telephone number is (502) 564-3601.

Photocopied payments and completed form to be submitted to: Office of Civil Rights and Small Business Development 6th Floor West 200 Mero Street Frankfort, KY 40622

DEFAULT OR DECERTIFICATION OF THE DBE

If the DBE subcontractor or supplier is decertified or defaults in the performance of its work, and the overall goal cannot be credited for the uncompleted work, the prime contractor may utilize a substitute DBE or elect to fulfill the DBE goal with another DBE on a different work item. If after exerting good faith effort in accordance with the Cabinet's Good Faith Effort policies and procedures, the prime contractor is unable to replace the DBE, then the unmet portion of the goal may be waived at the discretion of the Cabinet.

04/29/2015

ASPHALT MIXTURE

Unless otherwise noted, the Department estimates the rate of application for all asphalt mixtures to be 110 lbs/sy per inch of depth.

DGA BASE

Unless otherwise noted, the Department estimates the rate of application for DGA Base to be 115 lbs/sy per inch of depth.

DGA BASE FOR SHOULDERS

Unless otherwise noted, the Department estimates the rate of application for DGA Base for Shoulders to be 115 lbs/sy per inch of depth. The Department will not measure necessary grading and/or shaping of existing shoulders prior to placing of DGA Base, but shall be incidental to the Contract unit price per ton for DGA Base.

Accept payment at the Contract unit price per ton as full compensation for all labor, materials, equipment, and incidentals for grading and/or shaping of existing shoulders and furnishing, placing, and compacting the DGA Base.

INCIDENTAL SURFACING

The Department has included in the quantities of asphalt mixtures established in the proposal estimated quantities required for resurfacing or surfacing mailbox turnouts, farm field entrances, residential and commercial entrances, curve widening, ramp gores and tapers, and road and street approaches, as applicable. Pave these areas to the limits as shown on Standard Drawing RPM-110-06 or as directed by the Engineer. In the event signal detectors are present in the intersecting streets or roads, pave the crossroads to the right of way limit or back of the signal detector, whichever is the farthest back of the mainline. Surface or resurface these areas as directed by the Engineer. The Department will not measure placing and compacting for separate payment but shall be incidental to the Contract unit price for the asphalt mixtures.

ASPHALT PAVEMENT RIDE QUALITY CATEGORY B

The Department will apply Pavement Rideability Requirements on this project in accordance with Section 410, Category B.

FUEL AND ASPHALT PAY ADJUSTMENT

The Department has included the Contract items Asphalt Adjustment and Fuel Adjustment for possible future payments at an established Contract unit price of \$1.00. The Department will calculate actual adjustment quantities after work is completed. If existing Contract amount is insufficient to pay all items on the contract with the adjustments, the Department will establish additional monies with a change order.

OPTION A

Be advised that the Department will accept compaction of asphalt mixtures furnished for driving lanes and ramps, at 1 inch (25mm) or greater, on this project according to OPTION A in accordance with Section 402 and Section 403 of the current Standard Specifications. The Department will require joint cores as described in Section 402.03.02 for surface mixtures only. The Department will accept compaction of all other asphalt mixtures according to OPTION B.

GUARDRAIL DELIVERY VERIFICATION SHEET

Contract Id: _____ Contractor: _____

Section Engineer: _____ District & County: _____

DESCRIPTION	UNIT	QTY LEAVING PROJECT	QTY RECEIVED@BB YARD
GUARDRAIL (Includes End treatments & crash cushions)	LF	_____	_____
STEEL POSTS	EACH	_____	_____
STEEL BLOCKS	EACH	_____	_____
WOOD OFFSET BLOCKS	EACH	_____	_____
BACK UP PLATES	EACH	_____	_____
CRASH CUSHION	EACH	_____	_____
NUTS, BOLTS, WASHERS	BAG/BCKT	_____	_____
DAMAGED RAIL TO MAINT. FACILITY	LF	_____	_____
DAMAGED POSTS TO MAINT. FACILITY	EACH	_____	_____

***Required Signatures before Leaving Project Site**

Printed Section Engineer’s Representative _____ & Date _____

Signature Section Engineer’s Representative _____ & Date _____

Printed Contractor’s Representative _____ & Date _____

Signature Contractor’s Representative _____ & Date _____

***Required Signatures after Arrival at Bailey Bridge Yard (All material on truck must be counted & the quantity received column completed before signatures)**

Printed Bailey Bridge Yard Representative _____ & Date _____

Signature Bailey Bridge Yard Representative _____ & Date _____

Printed Contractor’s Representative _____ & Date _____

Signature Contractor’s Representative _____ & Date _____

****Payment for the bid item remove guardrail will be based upon the quantities shown in the Bailey Bridge Yard received column. Payment will not be made for guardrail removal until the guardrail verification sheets are electronically submitted to the Section Engineer by the Bailey Bridge Yard Representative.**

Completed Form Submitted to Section Engineer

Date: _____ By: _____

SPECIAL NOTE FOR GEOMEMBRANE INSTALLATION FOR IMPERMEABLE DETENTION BASIN CAMPBELL COUNTY, ITEM # 6-8105.05

PART 1 - GENERAL

1.01 Description

- A. This work shall consist of furnishing and installing a HDPE geomembrane lined detention basin in accordance with this document and the project plans. Geomembranes will have a textured surface. Install the geomembranes according to the plans or as directed by the Engineer for the purpose of creating an impermeable layer below the basin. The basin shall be constructed in a manner that maintains a positive gradient.
- B. The textured geomembrane shall be constructed of high density polyethylene (HDPE). Storage and handling of the geomembrane shall be in accordance with the Manufacturer's recommendations and this special note. Torn or punctured geomembranes shall not be used.

1.02 References

- 1. ASTM references throughout this document refer to the latest version of the American Society of Testing Materials referenced test.
- 2. Portions of Specification adapted from *International Association of Geosynthetic Installers HDPE Geomembrane Installation Specifications*.

1.03 Submittals

- A. Submit the following to the Engineer for review and approval, within a two week period prior to installation so as to expedite shipment or installation of the geomembrane:
 - 1. Documentation of Manufacturer's qualifications as specified in subsection 1.04A of this Section.
 - 2. Manufacturer's Quality Control program manual or descriptive documentation.
 - 3. A material properties sheet, including test methods used.
 - 4. Sample of the material.
 - 5. Example Material Warranty and Liner Installation Warranty complying with Subsections 1.07 and 1.08 of this Section.
 - 6. Resin Supplier's name, resin production plant identification, resin brand name and number, production date of the resin, resin Manufacturer's Quality Control

certificates, and certification that the properties of the resin meet the requirements for the project.

B. Installation Plan

1. Submit copies of Installation Plans for Engineer's approval within two weeks of the start of installation so as not to delay the start of geomembrane installation. Installation plans shall identify seams and details. Seams should generally follow the direction of the slope. Butt seams or roll-end seams should not occur on a slope unless approved by the Engineer's Representative. Butt seams on a slope, if allowed, should be staggered.
2. Placement of geomembrane will not be allowed to proceed until Engineer's Representative has received and approved the Installation Plan.

1.04 Quality Control

- A. Manufacturer's Qualifications: The Manufacturer of geomembrane of the type specified or similar product shall have at least five years experience in the manufacture of such geomembrane. In addition, the geomembrane Manufacturer shall have manufactured at least 5,000,000 FT² of the specified type of geomembrane or similar product during the last five years.

1.05 Delivery, Storage and Handling

- A. Each roll of geomembrane delivered to the site shall be labeled by the Manufacturer. The label shall be firmly affixed and shall clearly state the Manufacturer's name, product identification, material thickness, roll number, roll dimensions and roll weight.
- B. Geomembrane shall be protected from mud, dirt, dust, puncture, cutting, sunlight or any other damaging or deleterious conditions.
- C. Rolls shall be stored away from high traffic areas. Continuously and uniformly support rolls on a smooth, level prepared surface.
- D. Rolls shall not be stacked more than three high.

1.06 Project Conditions

- A. Geomembrane should not be installed in the presence of standing water, while precipitation is occurring, during excessive winds, or when material temperatures are outside the limits specified in Section 3.03.

1.07 Material Warranty

Furnish the suppliers material warranty.

1.08 Geomembrane Installation Warranty

- A. The geomembrane Installer shall guarantee the geomembrane installation against defects in the installation and workmanship for 1 year commencing with the date of final acceptance.

1.09 Geomembrane Pre-Construction Meeting

- A. A Geomembrane Pre-Construction Meeting shall be held at the site prior to installation of the geomembrane. At a minimum, the meeting shall be attended by the geomembrane Installer, Engineer, Engineer's representative(s) (CQA Firm), and the Earthwork Contractor.
- B. Topics for this meeting shall include:
1. Responsibilities of each party.
 2. Lines of authority and communication and resolution of any project document ambiguity.
 3. Methods for documenting, reporting and distributing documents and reports.
 4. Procedures for packaging and storing archive samples.
 5. Review of time schedule for all installation and testing.
 6. Review of panel layout.
 7. Procedures and responsibilities for preparation and submission of as-built panel and seam drawings.
 8. Temperature and weather limitations. Installation procedures for adverse weather conditions. Defining acceptable subgrade, geomembrane, or ambient moisture and temperature conditions for working during liner installation.
 9. Subgrade conditions, dewatering responsibilities and subgrade maintenance plan.
 10. Deployment techniques including allowable subgrade for the geomembrane.
 11. Plan for controlling expansion/contraction and wrinkling of the geomembrane.
 12. Covering of the geomembrane.
 13. Measurement and payment schedules.
 14. Health and safety.
- C. The meeting shall be documented by a person designated at the beginning of the meeting and minutes shall be transmitted to all parties.

PART 2 -
PRODUCTS

2.01 Source Quality Control

A. Manufacturing Quality Control

1. The Manufacturer's geomembrane quality control certifications, including results of quality control testing of the products, as specified in subsection 2.01.A.2 of this Section, must be supplied to the Engineer's Representative to verify that the materials supplied for the project are in compliance with all product and or project specifications in this Section. The certification shall be signed by a responsible party employed by the Manufacturer, such as the QA/QC Manager, Production Manager, or Technical Services Manager. Certifications shall include lot and roll numbers and corresponding shipping information.
2. The Manufacturer will provide Certification that the geomembrane and welding rod supplied for the project have the same base resin and material properties.

2.02 Geomembrane

- A. The textured geomembrane shall consist of new, first quality products designed and manufactured specifically for the purpose of this work which shall have been satisfactorily demonstrated by prior testing to be suitable and durable for such purposes. The geomembrane rolls shall be seamless, high density polyethylene containing no plasticizers, fillers or extenders and shall be free of holes, blisters or contaminants, and leak free. The geomembrane shall be supplied as a continuous sheet with no factory seams in rolls. The geomembrane will meet the property requirements as shown in the following table.

Property	Test method	Min Value or Requirement
Thickness	ASTM D5994	60 mils
Density	D 1505 / D 792	0.940 g/cc
Yield Strength	D 6693	110 lb/in
Break Strength	D 6693	85 lb/in
Yield Elongation	D 6693	12%
Break Elongation	D 6693	100%
Puncture Resistance	D 4833	70 lb
Tear Resistance	D 1004	35 lb
UV Resistance	D 7238 / D 3895	UV Resistant
Oxidative Induction Time	D 3895	100 min.

- B. Seaming shall be performed in the field using a welding system and quality control testing in strict accordance with the Manufacturer's specifications. The weld seam shall provide the same physical and chemical resistance properties as

the HDPE sheet.

PART 3 – EXECUTION

3.01 Subgrade Preparation

- A. The subgrade shall be prepared in accordance with the project specifications. The geomembrane subgrade shall be uniform and free of all sharp or angular objects that may damage the geomembrane prior to installation of the geomembrane. No objects larger than 0.5 inch should be protruding above the prepared subgrade.
- B. The geomembrane Installer and Engineer's Representative shall inspect the surface to be covered with the geomembrane on each day's operations prior to placement of geomembrane to verify suitability.
- C. The geomembrane Installer and Engineer's Representative shall provide daily written acceptance for the surface to be covered by the geomembrane in that day's operations. The surface shall be maintained in a manner, during geomembrane installation, to ensure subgrade suitability.
- D. All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to placement of the geomembrane. All repairs shall be approved by the Engineer's Representative and the geomembrane Installer. This damage, repair, and the responsibilities of the Contractor and geomembrane Installer shall be defined in the Preconstruction Meeting.

3.02 Geomembrane Placement

- A. No geomembrane shall be deployed until the applicable certifications and quality control certificates listed in Subsection 1.03 are submitted to and approved by the Engineer's Representative. Should geomembrane material be deployed prior to approval by the Engineer's Representative it will be at the sole risk of the geomembrane Installer and/or Contractor. If the material does not meet project specifications it shall be removed from the work area at no cost to the Engineer.
- B. The geomembrane shall be installed to the limits shown on the project drawings and essentially as shown on approved panel layout drawings.
- C. No geomembrane material shall be unrolled and deployed if the material temperatures are lower than 32 degrees F unless otherwise approved by the Engineer's Representative. The specified minimum temperature for material deployment may be adjusted by the Engineer's Representative based on recommendations by the Manufacturer. Temperature limitations should be defined in the preconstruction meeting. Typically, only the quantity of geomembrane that will be anchored and seamed together in one day should be deployed.
- D. No vehicular traffic shall travel on the geomembrane other than an approved low ground pressure All-Terrain Vehicle or equivalent.

- E. Sand bags or equivalent ballast shall be used as necessary to temporarily hold the geomembrane material in position under the foreseeable and reasonably - expected wind conditions. Sand bag material shall be sufficiently close- knit to prevent soil fines from working through the bags and discharging on the geomembrane.
- F. Geomembrane placement shall not be done if moisture prevents proper subgrade preparation, panel placement, or panel seaming. Moisture limitations should be defined in the preconstruction meeting.
- G. Damaged panels or portions of the damaged panels which have been rejected shall be marked and their removal from the work area recorded.
- H. The geomembrane shall not be allowed to "bridge over" voids or low areas in the subgrade. Any voids or low areas shall be filled and compacted prior to placing geomembrane. In these areas, the geomembrane shall be allowed to rest in intimate contact with the subgrade.
- I. Wrinkles caused by panel placement or thermal expansion should be minimized in accordance with Section 1.09 B11.
- J. Considerations on Site Geometry: In general, seams shall be oriented parallel to the line of the maximum slope. In corners and odd shaped geometric locations, the total length of field seams shall be minimized. Seams shall not be located at low points in the subgrade unless geometry requires seaming at such locations and if approved by the Engineer's Representative.
- K. Overlapping: The panels shall be overlapped prior to seaming to whatever extent is necessary to affect a good weld. In no case shall this overlap be less than 3 inches for welded seams.
- L. Overflow Structure Tie-in:
 - 1. Affix the geomembrane to the overflow structure at Station 221+69.55, 94.42' RT with adhesive approved by the Manufacturer. A minimum of 1.5' of glued geomembrane will be required.
 - 2. Install weepholes into the overflow structure at Station 221+69.55, 94.42' RT at appropriate locations to allow subsurface drainage. Weepholes should be positioned above the geomembrane and below the topsoil. Install a rock drain behind the weepholes using a 1-ft thickness of Kentucky Coarse Aggregate No. 2, 3 or 23 wrapped in Type IV Geotextile Fabric.
- M. Cover: A minimum of 2 ½ feet of total cover will be required above the geomembrane. The first 1 foot placed directly above the geomembrane will be a controlled fill with a top size of 0.5 inch. The material shall be placed in a single lift. A minimum 0.5 foot thickness of top soil will be required for establishing grass in the basin.

3.03 Seaming Procedures

- A. Seams shall be continuously welded.
- B. No geomembrane material shall be seam welded when liner temperatures are less than 32 degrees F unless allowed by the Engineer.
- C. Blisters, larger holes, and contamination by foreign matter shall be repaired by patches and/or extrusion weld beads as required. Each patch shall extend a minimum of 6 inches beyond all edges of the defect.

3.04 Liner Acceptance

- A. Geomembrane liner will be accepted by the Engineer's Representative when:
 - 1. The entire installation is finished or an agreed upon subsection of the installation is finished.
 - 2. All Installer’s QC documentation is completed and submitted to the Engineer.
 - 3. Verification of the adequacy of all field seams and repairs and associated geomembrane installation is complete.

3.05 Anchor Trench

- A. Construct as specified on the project drawings.

3.06 Paved Ditch Type I Provisions

- A. Refer to the detail sheet for Geomembrane Lined Detention Basin for details on geomembrane construction beneath paved ditches. Provide a minimum of 1.0 foot of cover between the bottom of the paved ditch anchors and the geomembrane.
- B. Connect the paved ditch to the overflow structure at Station 221+69.55, 94.42’ RT using drilled-in and grouted rebars, or other methods approved by the Engineer.

3.07 Disposal of Scrap Materials

- A. On completion of installation, the geomembrane Installer shall dispose of all trash and scrap material in a location approved by the Engineer, remove equipment used in connection with the work herein, and shall leave the premises in a neat acceptable manner. No scrap material shall be allowed to remain on the geomembrane surface.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Payment

All actions and materials required for construction of the Geomembrane Lined Detention Basin are incidental to the pay item.

<u>CODE</u>	<u>PAY ITEM</u>	<u>PAY UNIT</u>
24801EC	Impermeable Detention Basin Lining	Square Yards*

**Based on horizontal projection of basin area.*


SPECIAL NOTE

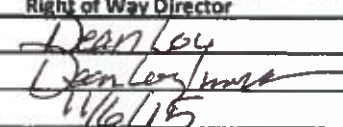
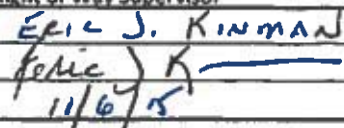
For Tree Removal

**Campbell County
New Route
Item No. 6-8105.05**

NO CLEARING OF TREES $\geq 3''$ DIAMETER (BREAST HEIGHT) FROM JUNE 1 –
JULY 31.

**If there are any questions regarding this note, please contact David Waldner,
Director, Division of Environmental Analysis, 200 Mero Street, Frankfort, KY
40601, Phone: (502) 564-7250.**

	KENTUCKY TRANSPORTATION CABINET Department of Highways DIVISION OF RIGHT OF WAY & UTILITIES	TC 62-226 Rev. 07/2015 Page 1 of 1
RIGHT OF WAY CERTIFICATION		

ITEM #	COUNTY	PROJECT #	FEDERAL PROJECT #
6-8105.05	Campbell	7697001R	HPP0155003
PROJECT DESCRIPTION CONSTRUCT CONNECTOR FROM JUST SOUTH OF KY 2345 (JOHN'S HILL ROAD) TO KY 2238.			
<input type="checkbox"/> NO ADDITIONAL RIGHT OF WAY REQUIRED			
Construction will be within the limits of the existing right of way. The right of way was acquired in accordance with FHWA regulations under the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended. No additional rights of way or relocation assistance were required for this project.			
<input checked="" type="checkbox"/> ADDITIONAL RIGHT OF WAY REQUIRED AND CLEARED			
TOTAL NUMBER OF PARCELS ON PROJECT		IMPROVEMENTS	
4			
NUMBER OF PARCELS THAT HAVE BEEN ACQUIRED BY:			
Signed Deed	4	<input checked="" type="checkbox"/> There were no improvements within the required right of way	
Condemnation		<input type="checkbox"/> All improvements have been removed from the required right of way	
Signed Right of Entry Agreement		<input type="checkbox"/> Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date	
RELOCATION ASSISTANCE			
Relocation Assistance was not required for this project		<input checked="" type="checkbox"/>	
All parties have been relocated in accordance with FHWA regulations		<input type="checkbox"/> Improvement removal will be included in the construction contract	
<input type="checkbox"/> ADDITIONAL RIGHT OF WAY REQUIRED WITH EXCEPTION			
TOTAL NUMBER OF PARCELS ON PROJECT			
Number of parcels acquired by Deed, Condemnation or Signed Right of Entry Agreement			
EXCEPTION(S)	ANTICIPATED DATE OF POSSESSION	IMPROVEMENTS	
		<input type="checkbox"/> There were no improvements within the required right of way	
		<input type="checkbox"/> All improvements have been removed from the required right of way	
		<input type="checkbox"/> Improvements are currently being removed and it is anticipated that right of way will be cleared prior to the letting date	
		<input type="checkbox"/> Improvement removal will be included in the construction contract	
RELOCATION ASSISTANCE			
Relocation assistance was not required for this project			<input type="checkbox"/>
All parties have been relocated in accordance with FHWA regulations			<input type="checkbox"/>
Notes/Comments:			
LPA		Right of Way Director	
Printed Name		Printed Name	Dean Loy
Signature		Signature	
Date		Date	11/6/15
Right of Way Supervisor		FHWA	
Printed Name	ERIC J. KINMAN	Printed Name	
Signature		Signature	
Date	11/6/15	Date	
		No Signature Required as per FHWA - KYTC 2013 Stewardship Agreement	

UTILITIES AND RAIL CERTIFICATION NOTE

**CAMPBELL COUNTY
00HPP 00155 005
FD52 019 76970 01U
JOHNS HILL ROAD TO THREE MILE ROAD CONNECTOR
ITEM NO. 06-8105.05**

GENERAL PROJECT NOTE ON UTILITY PROTECTION

Utility coordination efforts determined that there is significant utility relocation work required to complete the project. The information provided in this Utilities and Rail Certification Note may not be exact or complete and is provided for the contractor's use in planning the execution of the work. It shall be the road contractor's responsibility to verify the completeness and/or accuracy of all such information being furnished.

Flowable Fill Requirement

The road contractor MUST use flowable fill as the backfill media any place utility facilities cross under existing or proposed roadway surfaces unless concrete encasement is called for per plan. Compacted earth or flowable fill shall be used in all other ditches within the project limits. It should also be noted that the cost of the flowable fill shall be incidental to the cost of the utility line being installed.

Maintenance of Utility Services

All existing utility facilities are to be maintained throughout road construction. Temporary utility services to maintain service are to be provided and paid for by the road contractor as incidental to road construction. No additional compensation will be paid the contractor for temporary work and materials to maintain existing utility services. No unauthorized discharge of sewage due to the road contractor's work will be allowed.

Damage to Utilities

Any intentional or accidental disruption of service due to damage to any utility service mains caused by any of the contractor's operations without three days advance notice to the utility owner shall be cause for the Cabinet to charge liquidated damages in the amount of five thousand dollars per day (\$5,000/day) per occurrence against the contractor until such time as the utility service is restored.

Any intentional or accidental disruption of any individual utility service caused by any of the contractor's operations without three days advance notice to the utility owner shall be cause for the Cabinet to charge liquidated damages in the amount of five hundred dollars per day (\$500/day) per occurrence against the contractor until such time as service is restored.

Liquidated damages shall not be charged in addition for service disruptions when a main disruption is involved.

Abandoned Utilities

The contractor shall safeload the entire length of all abandoned pipes 6 inches in diameter and larger under proposed pavement and under any existing pavement that is to remain. The contractor shall safeload the entire length of all abandoned pipes 15 inches and larger which will be located outside of

UTILITIES AND RAIL CERTIFICATION NOTE

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proposed pavement but within project limits. Appropriate bid items have been included in the road contract. The safeloading criteria above shall be observed unless otherwise directed by the Resident Engineer or his representative.

External Utility Permits

The Kentucky Division of Water permits for water relocation and sanitary sewer work were not available before letting. These items will be distributed at the preconstruction meeting.

Utility Phasing

The contractor should be aware that some phases of the road construction will need to be completed first to accommodate the relocation of utilities and that some utilities will need to be relocated first to accommodate the relocation of others. The contractor should review the plans and draw his own conclusions as to the phasing of the road work and of various utilities. The contractor should pay close attention to the proximity of construction of new facilities when working in the vicinity of existing water mains and sanitary sewers to prevent blow-outs.

NOTE: DO NOT DISTURB THE FOLLOWING UTILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS

Northern Kentucky University, Northern Kentucky Water District, Sanitation District No 1, Duke Energy Electric, Duke Energy Gas, Cincinnati Bell Telephone, Level 3 Communications, Windstream Communications and Time Warner Cable have facilities that require relocation. Please see the notes below pertaining to their relocations.

Sanitation District No. 1 has facilities parallel to the east side of Three Mile Road just outside project limits. These SD1 facilities are not known to be in conflict with road construction.

The Contractor is fully responsible for protection of all utilities listed above

THE FOLLOWING COMPANIES ARE RELOCATING/ADJUSTING THEIR UTILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

None of the above listed utility owners are expected to have completed their relocation before road construction. The road contractor will be expected to coordinate work with these utility owners or complete utility relocation as a part of the road contract as detailed below

THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE COMPANY OR

UTILITIES AND RAIL CERTIFICATION NOTE

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THE COMPANY’S SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

Duke Energy Electric, Cincinnati Bell Telephone, Level 3 Communications, Windstream Communications, Time Warner Cable, and Duke Energy Gas have overhead and underground facilities to relocate. Relocation of these utilities should be completed by the utility companies by May 1, 2016. |

The Department will consider submission of a bid as the Contractor’s agreement to not make any claims for additional compensation due to delays or other conditions created by the operations of Duke Energy Electric, Cincinnati Bell Telephone, Level 3 Communications, and Windstream Communications, Time Warner Cable and Duke Energy Gas. Working days will not be charged for those days on which work on Duke Energy Electric, Cincinnati Bell Telephone, Level 3 Communications, Windstream Communications, Time Warner Cable, and Duke Energy Gas facilities is delayed, as provided in the current edition of the KY Standard Specifications for Road and Bridge Construction. Should a difference of opinion arise as to the rights of the Contractor and others working within the limits of, or adjacent to the project, the KYTC Section Engineer will decide as to the respective rights of the various parties involved in order to assure the completion of the Department’s work in general harmony and in a satisfactory manner, and his decision shall be final and binding upon the Contractor.

THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE ROAD CONTRACTOR AS INCLUDED IN THIS CONTRACT

NORTHERN KENTUCKY WATER DISTRICT AND NORTHERN KENTUCKY UNIVERSITY WATER AND SEWER FACILITIES are to be relocated by the road contractor as shown on the plan sets included in the roadway plans with specifications inserted in the project proposal.

Any alignment changes to proposed water or sanitary sewer facilities to accommodate unforeseen field conditions are possible. However, it is the responsibility of the roadway contractor to communicate any proposed alignment changes to the utility owner inspectors and the KYTC Section Engineer or their designated representatives prior to actually modifying the proposed alignment. |

THE FOLLOWING RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

- ☒ No Rail Involved
- ☐ Minimal Rail Involved (See Below)
- ☐ Rail Involved (See Below)

UTILITIES AND RAIL CERTIFICATION NOTE

**CAMPBELL COUNTY
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JOHNS HILL ROAD TO THREE MILE ROAD CONNECTOR
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SPECIAL CAUTION NOTE – PROTECTION OF UTILITIES

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs.

The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

BEFORE YOU DIG

UTILITIES AND RAIL CERTIFICATION NOTE

CAMPBELL COUNTY
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JOHNS HILL ROAD TO THREE MILE ROAD CONNECTOR
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The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

Please Note: The information presented in this Utility Note is informational in nature and the information contained herein is not guaranteed.

AREA UTILITIES CONTACT LIST

<u>Utility Company/Agency</u>	<u>Contact Name</u>	<u>Contact Information</u>
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GENERAL UTILITY NOTES AND INSTRUCTIONS APPLICABLE TO ALL UTILITY WORK MADE A PART OF THE ROAD CONSTRUCTION CONTRACT

The contractor should be aware the following utility notes and KYTC Utility Bid Item Descriptions shall supersede, replace and take precedence over any and all conflicting information that may be contained in utility owner supplied specifications contained in the contract, on plans supplied by the utility owner, or any utility owner specifications or information externally referenced in this contract.

Where information may have been omitted from these notes, bid item descriptions, utility owner supplied specifications or plans; the KYTC Standard Specifications for Road and Bridge Construction shall be referenced.

PROTECTION OF EXISTING UTILITIES

The existing utilities shown on the plans are shown as best known at the time the plans were developed and are to be used as a guide only by the Contractor. The Contractor shall use all means at his disposal to accurately locate all existing utilities, whether shown on the plans or not, prior to excavation. The contractor shall protect these utilities during construction. Any damage to existing utilities during construction that are shown or not shown on the plans shall be repaired at the Contractor's expense.

PREQUALIFIED UTILITY CONTRACTORS

Some utility owners may require contractors that perform relocation work on their respective facilities as a part of the road contract be prequalified or preapproved by the utility owner. Those utility owners with a prequalification or preapproval requirement are as follows:

"No contractors are required to be prequalified or preapproved by the utility owner(s) to perform utility relocation work under this contract."

The bidding contractor needs to review the above list and choose from the list of approved subcontractors at the end of these general notes as identified above before bidding. When the list of approved subcontractors is provided, only subcontractors shown on the following list(s) will be allowed to work on that utility as a part of this contract.

When the list of approved subcontractors for the utility work is not provided in these general notes, the utility work must be completed by either the prime contractor or a subcontractor that is prequalified with the KYTC Division of Construction Procurement in the work type of "Utilities" (I33). Those who would

like to become prequalified may contact the Division of Construction Procurement at (502) 564-3500. Please note: it could take up to 30 calendar days for prequalification to be approved. The prequalification does not have to be approved prior to the bid, but must be approved before the subcontract will be approved by KYTC and the work can be performed.

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

All utility work is being performed as a part of a contract administered by KYTC; there is not a direct contract between the utility contractor and utility owner. The KYTC Section Engineer is ultimately responsible for the administration of the road contract and any utility work included in the contract.

SUBMITTALS AND CORRESPONDENCE

All submittals and correspondence of any kind relative to utility work included in the road contract shall be directed to the KYTC Section Engineer, a copy of which may also be supplied to the utility owner by the contractor to expedite handling of items like material approvals and shop drawings. All approvals and correspondence generated by the utility owner shall be directed to the KYTC Section Engineer. The KYTC Section Engineer will relay any approvals or correspondence to the utility contractor as appropriate. At no time shall any direct communication between the utility owner and utility contractor without the communication flowing through the KYTC Section Engineer be considered official and binding under the contract.

ENGINEER

Where the word "Engineer" appears in any utility owner specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the "Engineer" is the Kentucky Transportation Cabinet (KYTC) Section Engineer or designated representative and the utility owner engineer or designated representative jointly. Both engineers must mutually agree upon all decisions made with regard to the utility construction. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

Where the word “Inspector” or “Resident Project Representative” appears in the utility specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the “Inspector” or “Resident Project Representative” is the utility owner inspector and KYTC inspector jointly. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

NOTICE TO UTILITY OWNERS OF THE START OF WORK

One month before construction is to start on a utility, the utility contractor shall make notice to the KYTC Section Engineer and the utility owner of when work on a utility is anticipated to start. The utility contractor shall again make confirmation notice to the KYTC Section Engineer and the utility owner one week before utility work is to actually start.

UTILITY SHUTDOWNS

The Contractor shall not shut down any active and in-service mains, utility lines or services for any reason unless specifically given permission to do so by the utility owner. The opening and closing of valves and operating of other active utility facilities for main, utility line or utility service shut downs are to be performed by the utility owner unless specific permission is given to the contractor by the owner to make shutdowns. If and when the utility owner gives the contractor permission to shutdown mains, utility lines or utility services, the contractor shall do so following the rules, procedures and regulations of the utility owner. Any permission given by the utility owner to the contractor to shutdown active and in-service mains, utility lines or services shall be communicated to the KYTC Section Engineer by the utility owner that such permission has been given.

Notice to customers of utility shut downs is sometimes required to be performed by the utility contractor. The contractor may be required; but, is not limited to, making notice to utility customers in a certain minimum amount of time in advance of the shut down and by whatever means of communication specified by the utility owner. The means of communication to the customer may be; but is not limited to, a door hanger, notice by newspaper ad, telephone contact or any combination of communication methods deemed necessary, customary and appropriate by the utility owner. The contractor should refer to the utility owner specifications for requirements on customer notice.

Any procedure the utility owner may require the contractor to perform by specification or plan note and any expense the contractor may incur to comply with the utility owner’s shut down procedure and notice to customers shall be considered an incidental expense to the utility construction.

STATIONS AND DISTANCES

All stations and distances, when indicated for utility placement in utility relocation plans or specifications, are approximate; therefore, some minor adjustment may have to be made during construction to fit actual field conditions. Any changes in excess of 6 inches of plan location shall be reviewed and approved jointly by the KYTC Section Engineer or designated representative and utility owner engineer or

designated representative. Changes in location without prior approval shall be remedied by the contractor at his own expense if the unauthorized change creates an unacceptable conflict or condition.

RESTORATION

Temporary and permanent restoration of paved or stone areas due to utility construction shall be considered incidental to the utility work. No separate payment will be made for this work. Temporary restoration shall be as directed by the KYTC Section Engineer. Permanent restoration shall be “in-kind” as existing.

Restoration of seed and sod areas will be measured and paid under the appropriate seeding and sodding bid items established in the contract for roadway work.

BELOW ARE NOTES FOR WHEN “INST” ITEMS ARE IN THE CONTRACT MEANING THE UTILITY COMPANY IS PROVIDING CERTAIN MATERIALS FOR UTILITY RELOCATION

MATERIAL

Contrary to Utility Bid Item Descriptions, those bid items that have the text “**Inst**” at the end of the bid item will have the major components of the bid item provided by the utility owner. No direct payment will be made for the major material component(s) supplied by the utility company. All remaining materials required to construct the bid item as detailed in utility bid item descriptions, in utility specifications and utility plans that are made a part of this contract will be supplied by the contractor. The contractor’s bid price should reflect the difference in cost due to the provided materials.

The following utility owners have elected to provide the following materials for work under this contract:

“No materials are being supplied by the utility owner(s). All materials are to be supplied by the contractor per bid item descriptions, utility specifications and utility plans.”)

SECURITY OF SUPPLIED MATERIALS

If any utility materials are to be supplied by the utility owner, it will be the responsibility of the utility contractor to secure all utility owner supplied materials after delivery to the project site. The utility contractor shall coordinate directly with the utility owner and their suppliers for delivery and security of the supplied materials. Any materials supplied by the utility owner and delivered to the construction site that are subsequently stolen, damaged or vandalized and deemed unusable shall be replaced with like materials at the contractor’s expense.

Standard Water Bid Item Descriptions

W AIR RELEASE VALVE This bid item description shall apply to all air release valve installations of every size except those defined as “Special”. This item shall include the air release valve, main to valve connecting line or piping, manhole, vault, structure, access casting or doors, tapping the main, labor, equipment, excavation, proper backfill and restoration required to install the air release valve at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. All air release/vacuum valves on a project shall be paid under one bid item regardless of size. No separate pay items will be established for size variations. Only in the case of the uniqueness of a particular air release valve would a separate bid item be established. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

BOLLARDS This item is for payment for furnishing and installing protective guard posts at above ground utility installations. A bollard may consist of, but not limited to, a steel post set in concrete or any other substantial post material. This item shall include all labor, equipment, and materials needed for complete installation of the bollard as specified by the utility owner specifications and plans. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

NOTE: A bid code for this item has been established in standard roadway bid items and shall be used for payment of this item. The bid code is 21341ND

W CAP EXISTING MAIN This item shall include the specified cap, concrete blocking and/or mechanical anchoring, labor, equipment, excavation, backfill, and restoration required to install the cap at the location shown on the plans or as directed in accordance with the specifications. This item is not to be paid on new main installations. This pay item is only to be paid to cap existing mains. Caps on new mains are incidental to the new main. Any and all caps on existing mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W DIRECTIONAL BORE Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of water main under streets, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W ENCASEMENT CONCRETE Includes all labor, equipment, excavation, concrete, reinforcing steel, backfill, restoration, and etc., to construct the concrete encasement of the water main as shown on the plans, and in accordance with the specifications and standard drawings. Payment under this item shall be in addition to the carrier pipe as paid under separate bid items. Carrier pipe is not included in this bid item. Any and all concrete encasement shall be paid under one bid item included in the contract regardless of the size of the carrier pipe or the volume of concrete or steel reinforcement as specified in the plans and specifications. No separate bid items will be established for size variations. Measurement of pay quantity shall be from end of concrete to end of concrete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W ENCASEMENT STEEL BORED This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to bore and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The sizes of encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.) Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W ENCASEMENT STEEL OPEN CUT This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to open cut and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The size encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.) Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W FIRE HYDRANT ADJUST Includes all labor, equipment, excavation, materials, and backfill to adjust the existing fire hydrant using the fire hydrant manufacturer's extension kit for adjustments of 18" or less. Adjustments greater than 18" require anchoring couplings and vertical bends to adjust to grade. The Contractor will supply and install all anchor couplings, bends, fire hydrant extension, concrete blocking, restoration, granular drainage material, etc, needed to adjust the fire hydrant complete and ready for use as shown on the plans, and in accordance with the specifications and standard drawings. This also includes allowing for the utility owner inspector to inspect the existing fire hydrant prior to adjusting, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete and ready for use.

W FIRE HYDRANT ASSEMBLY Includes all labor, equipment, new fire hydrant, isolating valve and valve box, concrete pad around valve box (when specified in specifications or plans), piping, anchoring tee, anchoring couplings, fire hydrant extension, excavation, concrete blocking, granular drainage material, backfill, and restoration, to install a new fire hydrant assembly as indicated on plans and on standard drawings complete and ready for use. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FIRE HYDRANT RELOCATE This item includes all labor and equipment to remove the existing fire hydrant from its existing location and reinstalling at a new location. This item shall include a new isolating valve and valve box, concrete pad around valve box (when required in specifications or plans), new piping, new anchoring tee, anchoring couplings, fire hydrant extensions, concrete blocking, restoration, granular drainage material, excavation, and backfill as indicated on plans, specifications, and on standard drawings complete and ready for use. This item shall also include allowing for utility owner inspector to inspect the existing fire hydrant prior to reuse, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant for use, if the existing fire hydrant is determined unfit for reuse. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FIRE HYDRANT REMOVE This bid item includes removal of an abandoned fire hydrant, isolating valve, and valve box to the satisfaction of the engineer. The removed fire hydrant, isolating valve and valve box shall become the property of the contractor for his disposal as salvage or scrap. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FLUSH HYDRANT ASSEMBLY This item shall include the flushing hydrant assembly, service line, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the flush hydrant at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FLUSHING ASSEMBLY This item shall include the flushing device assembly, service line, meter box and lid, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the

flushing device at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W LINE MARKER This item is for payment for furnishing and installing a ground level water utility line marker as specified by the utility owner specifications and plans. A line marker may consist of a post or monument of whatever materials specified and shall include markings and/or signage on same as specified by plans or specifications. This item shall include all labor, equipment, and materials needed for complete installation of the marker. This item shall be paid EACH (EA) when complete.

W MAIN POINT RELOCATE This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing water main at point locations such as to clear a conflict at a proposed drainage structure, pipe or any other similar short relocation situation, and where the existing pipe material is to be reused. The contractor shall provide any additional pipe or fitting material needed to complete the work as shown on the plans and specifications. The materials provided shall be of the same type and specification as those that exist. Substitution of alternative materials shall be approved by the engineer in advance on a case by case basis. New polyethylene wrap is to be provided (if wrap exists or is specified in the specifications to be used). If it is necessary that the pipe be disassembled for relay, payment under this item shall also include replacement of joint gaskets as needed. Bedding and backfill shall be provided and performed the same as with any other pipe installation as detailed in the plans and specifications. Payment under this item shall be for each location requiring an existing main to be relocated horizontally or vertically regardless of pipe size or relocation length. No separate pay items will be established for pipe size variations or relocation segment length variations. Water Main Relocate shall not be paid on a linear feet basis; but, shall be Paid EACH (EA) at each location when complete and placed in service. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

W METER This item is for payment for installation of all standard water meters of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER ADJUST This item includes all labor, equipment, excavation, materials, backfill, restoration, and etc., to adjust the meter casting to finished grade (whatever size exists) at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER RELOCATE This item includes all labor, equipment, excavation, additional fittings, disinfection, testing, restoration, and etc., to relocate the existing water meter (whatever size exists), meter yoke, meter box, casting, and etc., from its old location to the location shown on the plans or as directed, in accordance with the specifications and standard drawings complete and ready for use. The new service pipe (if required) will be paid under short side or long side service bid items. Any and all meter

relocations of 2 inches or less shall be paid under one bid item included in the contract regardless of size. Each individual relocation shall be paid individually under this item; however, no separate bid items will be established for meter size variations of 2 inches ID or less. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER VAULT SIZE RANGE 1 OR 2 This item is for payment for installation of an underground structure for housing of a larger water meter, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s) valve(s), all piping, and fitting materials associated with installing a functioning meter and vault in accordance with the plans, standard drawings, and specifications, complete and ready for use. The size shall be the measured internal diameter of the meter and piping to be installed. The size meter vault to be paid under size 1 or 2 shall be as follows:

Size Range 1 = All meter and piping sizes greater than 2 inches up to and including 6 inches
Size Range 2 = All meter and piping sizes greater than 6 inches

This item shall be paid EACH (EA) when complete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

W METER/FIRE SERVICE COMBO VAULT This item is for payment for installation of an underground structure for housing of a water meter and fire service piping, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s), valve(s), all piping, and fitting materials associated with installing a functioning meter and fire service vault in accordance with the plans and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER WITH PRESSURE REDUCING VALVE (PRV) This item is for payment for installation of all standard water meters with pressure reducing valves (PRV) of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, PRV, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter with PRV in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W PIPE This description shall apply to all PVC, ductile iron, and polyethylene/plastic pipe bid items of every size and type to be used as water main, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall also include pipe anchors, at each end of polyethylene pipe runs when

specified to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W PLUG EXISTING MAIN This item shall include the specified plug, concrete blocking and/or anchoring, labor, equipment, excavation, backfill, and restoration required to install the plug in an existing in-service main that is to remain at the location shown on the plans or as directed in accordance with the specifications. Any and all plugs on all existing in-service mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

NOTE: This utility bid item is not to be paid on new main installations or abandoned mains. This pay item is to plug existing in-service mains only. Plugs on new mains are incidental to the new main just like all other fittings.

NOTE: Plugging of existing abandon mains shall be performed and paid in accordance with Section 708.03.05 of KYTC Standard Specifications For Road And Bridge Construction and paid using Bid Code 01314 Plug Pipe.

W PRESSURE REDUCING VALVE This description shall apply to all pressure reducing valves (PRV) of every size required in the plans and specifications except those bid items defined as "Special". Payment under this description is to be for PRVs being installed with new main. This item includes the PRV as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), pit or vault, backfill, restoration, testing, disinfection, and etc., required to install the specified PRV at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, PRVs shall be restrained. PRV restraint shall be considered incidental to the PRV and adjoining pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W PUMP STATION This item is for payment for installation of pumps and an above or below ground structure for housing of the pumps. This item shall include all pumps, piping, fittings, valves, electrical components, building materials, concrete, any other appurtenances, labor, equipment, excavation, and backfill, to complete the pump station installation as required by the plans, standard drawings, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LUMP SUM (LS) when complete.

W REMOVE TRANSITE (AC) PIPE This item shall include all labor, equipment, and materials needed for removal and disposal of the pipe as hazardous material. All work shall be performed by trained and certified personnel in accordance with all environmental laws and regulations. Any and all transite AC pipe removed shall be paid under one bid item included in the contract regardless

of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W SERVICE LONG SIDE This bid item description shall apply to all service line installations of every size bid up to and including 2 inch inside diameter, except those service bid items defined as "Special". This item includes the specified piping material, main tap, tapping saddle (if required), and corporation stop materials, coupling for connecting the new piping to the surviving existing piping, encasement of 2 inches or less internal diameter (if required by plan or specification), labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service installations where the ends of the service connection are on opposite sides of the public roadway and the service line crosses the centerline of the public roadway as shown on the plans. The length of the service line is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for special bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W SERVICE SHORT SIDE This bid item description shall apply to all service line installations of every size up to and including 2 inch internal diameter, except those service bid items defined as "Special". This item includes installation of the specified piping material of the size specified on plans, encasement of 2 inches or less internal diameter (if required by plan or specification), main tap, tapping saddle (if required), corporation stop, coupling for connecting the new piping to the surviving existing piping, labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service installations where both ends of the service connection are on the same side of the public roadway, or when an existing service crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service line is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the service crosses a private residential or commercial entrance; but, not a public roadway. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W SERVICE RELOCATE This item is for the relocation of an existing water service line where a meter is not involved, and where an existing service line can easily be adjusted by excavating alongside and moving the line horizontally and/or vertically a short distance without cutting the service line to avoid conflicts with road construction. This item shall include excavation, labor, equipment, bedding, and

backfill to relocate the line in accordance with the plans and specifications complete and ready for use. Payment under this item shall be for each location requiring relocation. Payment shall be made under this item regardless of service size or relocation length. No separate pay items will be established for size or length variation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W STRUCTURE ABANDONMENT This item is to be used to pay for abandonment of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., abandonment of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted fill or flowable fill for abandonment of the structure in place and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W STRUCTURE REMOVAL This item is to be used to pay for removal of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., removal of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted backfill for removal of the structure and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W TAPPING SLEEVE AND VALVE SIZE 1 OR 2 This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

- Size 1 = All live tapped main sizes up to and including 8 inches
- Size 2 = All live tapped main sizes greater than 8 inches

Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W TIE-IN This bid description shall be used for all main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, disinfection, testing and backfill required to make the water main tie-in as shown on the plans, and in accordance with the specifications complete and ready for use. Pipe for tie-ins shall be paid under separate bid items. This item shall be paid EACH (EA) when complete.

W VALVE This description shall apply to all valves of every size required in the plans and specifications

except those bid items defined as “Special”. Payment under this description is to be for gate or butterfly valves being installed with new main. This item includes the valve as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), valve box and valve stem extensions, backfill, concrete pad around valve box (if required by specification), restoration, testing, disinfection, and etc., required to install the specified valve at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, valves shall be restrained. Valve restraint shall be considered incidental to the valve and adjoining pipe. This description does not apply to cut-in valves. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE ANCHOR EXISTING This bid item is intended to pay for installation of restraint hardware on an existing valve where no restraint exists to hold the valve in place to facilitate tie-ins and other procedures where restraint is prudent. This work shall be performed in accordance with water specifications and plans. This bid item shall include all labor equipment, excavation, materials and backfill to complete restraint of the designated valve, regardless of size, at the location shown on the plans, complete and ready for use. Materials to be provided may include, but is not limited to, retainer glands, lugs, threaded rod, concrete, reinforcing steel or any other material needed to complete the restraint. Should the associated valve box require removal to complete the restraint, the contractor shall reinstall the existing valve box, the cost of which shall be considered incidental to this bid item. No separate bid items are being provided for size variations. All sizes shall be paid under one bid item. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE BOX ADJUST Includes all labor, equipment, valve box and valve stem extensions (if required), excavation, backfill, concrete pad around valve box (when specified in specifications or plans), restoration, and etc., to adjust the top of the box to finished grade complete and ready for use. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE CUT-IN This bid description is for new cut-in valve installations of all sizes where installation is accomplished by cutting out a section of existing main. This item shall include cutting the existing pipe, supplying the specified valve, couplings or sleeves, valve box, concrete pad around valve box (when required in specifications or plans), labor, equipment, and materials to install the valve at the locations shown on the plans, or as directed by the engineer, complete and ready for use. Any pipe required for installation shall be cut from that pipe removed or supplied new by the contractor. No separate payment will be made for pipe required for cut-in valve installation. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE VAULT This item is for payment for installation of an underground structure for housing of specific valve(s) as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or doors, the specified valve(s), all piping, and fitting materials associated with installing a functioning valve vault in accordance with the plans, standard drawing, and specifications, complete and ready for use. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

NORTHERN KENTUCKY WATER DISTRICT SPECIFICATIONS

REVISED FOR KYTC ITEM 06-8105.05 KY 9

October 29, 2015

**These specifications to also be used for relocation of the
NKU owned 6 inch main feeding Campbell Hall**

**GENERAL INSTRUCTIONS AND SPECIAL NOTES SPECIFIC
TO NORTHERN KENTUCKY WATER DISTRICT**

1. **PRIOR INSPECTION OF EXISTING METER SETTINGS** The Contractor, with the Northern Kentucky Water District's inspector, shall make an inspection of all meter settings to be adjusted or relocated prior to construction. Any meter setting not up to Northern Kentucky Water District standard shall be noted and parts furnished to the Contractor by the Northern Kentucky Water District for installation as needed. Any water meter setting, fire hydrant or any other water facilities that are to be relocated, adjusted, reused or remain and are damaged by the Contractor shall be repaired at the contractors expense. Any old water meter settings removed and not reused shall be turned over to the Northern Kentucky Water District.
2. **SPECIAL BACKFILL NOTE** No sand or granular material shall be used for backfill above 12" over the top of the pipe or around structures. Only compacted soil or flowable fill shall be used unless approved or otherwise directed by the KYTC Section Engineer.
3. **GENERAL SAFETY** For the security and safety of people in and adjacent to trenches or construction operations, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors Association of America, the "Manual On Uniform Traffic Control Devices" published by the Federal Highway Administration, and the safety regulations of the appropriate state and local agencies shall be followed when specifically applicable, or by similarity of operation or as necessary for adequate protection.
4. **MATERIAL HANDLING** Pipe, fittings, valves, hydrants, and accessories shall be loaded, unloaded, and handled by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against other pipe.
5. **PROTECTION OF PAVEMENT** Where main construction is located in or adjacent to pavements, all construction equipment shall have rubber tires. Crawler equipment will be permitted when there is no danger of damaging pavement.
6. **NOISE, DUST AND ODOR CONTROL** The Contractors construction activities shall be conducted so as to eliminate all unnecessary noise, dust, and odors. The use of oil or other materials, for dust control, which may cause tracking will not be permitted.
7. **EXCAVATION AND CONSTRUCTION MATERIALS** All excavated material and all construction materials in prosecution of the work shall be deposited so as not to endanger the work, create unnecessary annoyance to the public, or interfere with natural drainage courses. During the course of the work, all material piles shall be kept trimmed up and maintained in a neat, workmanlike manner. All material piles shall be kept a reasonable distance away from roadways so as not to cause a hazard and block the motorists view.
8. **PROTECTION OF TREES, SHRUBS, AND OTHER ITEMS TO REMAIN** Special care shall be taken by the Contractor to avoid unnecessary damage to trees or shrubs and their root systems or any other items shown to remain. Should the Contractor do unnecessary damage to any item shown to remain, the item shall be repaired or replaced at the contractors expense. Should unnecessary damage be caused to items to remain and is determined not repairable, the Contractor shall compensate the owner for the loss if any.

9. **UNACCEPTABLE EXCAVATED TRENCH MATERIAL** Any excavated trench material which is determined unacceptable for backfill shall be removed from the area and wasted at a location acquired by the Contractor and approved by the KYTC Section Engineer. Acceptable backfill material shall be acquired by the Contractor at a location approved by the KYTC Section Engineer. The disposition and handling of unacceptable material and the acquisition and handling of acceptable material shall be at the Contractors expense.
10. **BLASTING ROCK** No blasting of rock shall be performed without specific permission of the KYTC Section Engineer. Blasts shall be properly covered and all utilities and structures in the area shall be properly protected. Warning shall be given to all persons in the area who could be affected by the blasting. Blasting shall be at the risk of the Contractor who shall be liable for all damages to persons or property caused by the blasting. All blasting shall be performed in accordance with all regulations of the Kentucky Department of Mines and Minerals and all other governing agencies having jurisdiction. The Kentucky Department of Mines and Minerals, area emergency response agencies, utility companies with utilities in the area shall be notified of the blasting sufficiently in advance.
11. **ABANDONED VALVES** The valve boxes shall be removed from all abandoned valves prior to final roadway paving. This shall be done to the satisfaction of the Engineer. Paving over a valve box without removing same will not be acceptable. No separate payment will be made for removal of valve boxes but shall be considered incidental to water line construction.
12. **SALVAGED AND STOCKPILED ITEMS** The Contractor shall salvage all items in a workmanlike manner. Any item damaged by the Contractor thru negligence shall be replaced with new items at the contractors expense. All salvaged items to be stockpiled and picked up by NKWD, shall be stored in a safe place until pickup. The Contractor is to notify NKWD at 859-578-9898 when salvaged items are available for pickup.
13. **CONSTRUCTION PROCEDURE** The successful contractor to prepare construction procedure with respect to the installation of water utilities. The Sequence and Procedure of Water Utilities Construction shall be approved by the Northern Kentucky Water District's Engineering Department prior to the beginning of the water utilities relocations.

MATERIAL SPECIFICATIONS

1. **CONCRETE** All concrete shall be Class A in accordance with KYDOH Standard Specs. for Road and Bridge Construction current edition and shall be placed in accordance with same unless otherwise noted. The concrete shall be placed to the dimensions as required in the plans or specifications. Reinforcing steel shall be placed in the concrete as required in the plans or specifications.
2. **CONCRETE REINFORCING STEEL** All reinforcing steel shall be Grade 40. The size, location, placement, and quantity shall be as required in the plans or specifications.
3. **WATER MAIN**
 - A. **DUCTILE IRON PIPE.** Ductile iron pipe shall meet the requirements of ANSI A21.51 (AWWA C151)
 1. **Material.** The chemical constituents shall meet the physical property recommendations of ASTM A536 to ensure that the iron is suitable for satisfactory drilling and cutting.
 2. **Minimum Thickness.** Unless otherwise shown on the plans, the minimum thickness of the barrel of the pipe shall be Class 52. All pipe shall be clearly marked as to class by the manufacturer.
 3. **Coating and Lining.** The pipe shall be coated outside with a bituminous coating in accordance with ANSI A 21.51 (AWWA C151) and lined inside with cement mortar and seal coated in accordance with ANSI A21.4 (AWWA- C104).
 4. **Fittings & Glands.** Fittings and glands shall be ductile iron as specified in Section 3A, "Ductile Iron Fittings".
 5. **Polyethylene Encasement.** Ductile Iron Pipe shall be encased with Polyethylene film conforming to ANSI A21.5 (AWWA C105)
 - B. **PIPE JOINTS**
 1. **Push on and Mechanical.** - Push-on and mechanical joints including accessories shall conform to ANSI A21.11 (AWWA-C111). Bolts shall be high strength COR-10 tee head with hex nuts. The maximum deflection at push-on joints and/or mechanical joints shall be 5 degrees or as recommended by the Manufacturer.
 2. **Flanged.** - Flanged joints shall meet the requirements of ANSI A21.15 (AWWA C115) or ANSI B16.1
 - a. **Gaskets.** All flanged joints shall be furnished with 1/16 inch thick full face red rubber.
 - b. **Bolts.** Bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions all as specified in ANSI B18.2. For bolts of 1-3/4 inches in diameter and larger, bolt studs with a nut on each end are recommended. Material for bolts and nuts shall conform to ASTM A307, Grade B.

3. **Restrained.** - If restrained joint system is required on the plans, all pipes, bends, tees, etc. shall be restrained push-on joint pipe and fittings utilizing ductile iron components. Restrained joint pipe shall be ductile iron manufactured in accordance with the requirements of ANSI/AWWA C151/A21.51. Push-on joints for pipe shall be in accordance with ANSI/AWWA C111/A21.11 "Rubber-Gasket Joints for Ductile-Iron Pipe and Fittings." Pipe thickness shall be designed in accordance with ANSI/AWWA C150/A21.50 "Thickness Design of Ductile-Iron Pressure Pipe," and shall be based on laying conditions and internal pressures as stated in the project plans and specifications. All restrained joint pipe and fittings shall be boltless, flexible and capable of deflection after installation. Restrained joint pipe and fittings shall be U.S. Pipe's TR FLEX restrained joint system, American's Flex-Ring or pre-approved equal. Restraint of field cut pipe shall be provided with U.S. Pipe's TR FLEX GRIPPER® Ring, TR FLEX Pipe field weldments or pre-approved equal. Method of restraining and laying schedule shall be approved by the District prior to the start of the project. Manufacturer installation instructions shall be followed. Restrained joints shall be capable of withstanding a maximum joint pressure of 250 psi. unless otherwise noted. **Mechanical joints with retainer gland and Field Lok® gaskets (or approved equals) are not acceptable unless otherwise specified (note: exception for valves and Special Restrained Joint).**

Exception to Restraint Specifications: Valves shall be restrained using mechanical joint restraint devices consisting of multiple gripping wedges incorporated into a follower gland compatible with all mechanical joints or MJ Field Lok conforming to the requirements of ANSI/AWWA C111/A21.11. Gland body, wedges and wedge actuating components shall be cast from 65-45-12 ductile iron and shall have a working pressure of 250 psi. Megalug Series 1100, MJ Field Lok® or approved equal.

Exception for Special Restrained Joints: When called out in bid items, special restrained joint pipe gaskets shall develop a wedging action between pairs of high-strength stainless steel elements spaced around the gasket (Field Lok®, Fast-Grip® or approved equal gaskets). The bend shall be restrained using mechanical joint restraint devices consisting of multiple gripping wedges incorporated into a follower gland compatible with all mechanical joints (Megalug Series 1100®, MJ Field Lok® or approved equal). Restrained push-on joints shall conform to ANSI A21.11 (AWWA C111).

- a. **Bell and Spigot** Bell and spigot joints shall conform to ANSI A21.6.

4. **FITTINGS**

- A. **DUCTILE IRON FITTINGS.** Ductile Iron Compact Fittings and accessories shall conform to AWWA C153 and Full Body Fittings - and accessories to AWWA C110. Bolts and nuts shall be high strength, corrosion resistant alloy, such as "Cor-Ten" or approved equal.

1. **Working Pressures.** All fittings and accessories shall be Ductile Iron, rated for a minimum of 200 psi working pressure or as specified herein. The fittings and accessories shall be new and unused. (NOTE: Certain areas of the District's service area require materials used, to be of a higher working pressure than 200 psi.)

2. Coating and Lining. The fittings shall be coated outside with a bituminous coating in accordance with ANSI A21.10 (AWWA C110) and lined inside with cement mortar and seal coated in accordance with ANSI A21.4 (AWWA C104).
3. Fittings and Glands. All pipe fittings shall be mechanical joint fittings. Mechanical joints shall conform to AWWA C111.
4. Polyethylene Encasement. Ductile Iron Fittings shall be encased with polyethylene film conforming to ANSI A21.5 (AWWA C105)

B. JOINTS

1. Mechanical. Mechanical joints including accessories shall conform to ANSI A21.11 (AWWA C111). Glands shall be ductile iron. Bolts shall be high strength COR-10 tee head with hex nuts.
2. Flanged. Flanged joints shall meet the requirements of ANSI A21.15 (AWWA C115) OR ANSI B16.1 and be used with the express approval of the Engineer.
 - a. Gaskets. All flanged joints shall be furnished with 1/16 inch thick full face red rubber.
 - b. Bolts. Bolts shall be stainless steel and have American Standard heavy unfinished hexagonal head and nut dimensions all as specified in ANSI B18.2. For bolts of 1-3/4 inches in diameter and larger, bolt studs with a nut on each end are recommended. Material for bolts and nuts shall conform to ASTM A307, Grade B.
3. Restrained. If restrained joints is shown on the plans, all pipe, bends, valves, etc. shall be restrained.
 - a. Bell and Spigot. Bell and spigot joints shall conform to ANSI A21.6.

5. POLYETHYLENE WRAP

All ductile iron pipe, fittings, valves, and fire hydrant leads shall be polyethylene wrapped, installed according to the current edition of AWWA C105. Ductile iron fittings, valves, and fire hydrant leads used in the installation of P.V.C. pipe shall be included.

- A. Material. Polyethylene wrap shall be a minimum of 8-mil thickness low-density film or 4-mil thickness high-density cross-laminated polyethylene tube per AWWA C105. Polyethylene tube shall be blue in color.
- B. Installation. The contractor shall cut the roll in tubes 2 feet longer than a standard length of pipe. Each tube shall be slipped over the length of pipe, centering to allow a 1' overlap on each adjacent pipe section. After the lap is made, slack in the tubing shall be taken up for a snug fit and the overlay shall be secured with polyethylene tape.

Pipe shall not be wrapped and stored on site for any period of time, but wrapped and immediately placed in the trench, fittings shall be wrapped prior to installing blocking or pads. (see Standard Drawing #104) Polyvinyl chloride pipe requires no wrap. Odd shaped appurtenances such as valves, tees, fittings, and other ferrous metal pipeline

appurtenances shall be wrapped by using a flat sheet of polyethylene. Wrapping shall be done by placing the sheet under the appliances and bringing the edges together, folding twice, and taping down.

6. **FIRE HYDRANTS**

A. **DESCRIPTION.** The Contractor shall provide all labor, materials, tools, and equipment required to furnish and install in good workmanlike manner all fire hydrants complete and ready for service where shown on the plans or where directed by the Engineer and as specified herein.

B. **FIRE HYDRANTS.** Fire hydrants shall conform to AWWA C502. Hydrants shall conform to the standards of the Northern Kentucky Water District as SHOWN on the plans. All fire hydrants shall have auxiliary valves for isolating water flow to the hydrant. All fire hydrants and auxiliary valves shall be positively locked to the water main by restrained joints, hydrant adapters, or other approved method.

Hydrants shall be designed to 200 psi working pressure and shall be shop tested to 300 psi hydrostatic pressure with the main valve both open and closed. The barrel shall have a breakable safety section and/or base bolts just above the ground line. Hydrants shall have a main valve opening of 5 1/4 inches, a 6 inch mechanical joint inlet to be suitable for setting in a trench 1,000 mm (3' 6") deep minimum, and shall be the traffic style hydrant so that the main valve remains closed when the barrel is broken off. Hydrants shall have a dry top and shall be self draining, when the main valve is closed. Self draining hydrants shall drain to dry wells provided exclusively for that purpose. Hydrant drains shall not be connected to storm or sanitary sewers. Hydrants located generally in the Covington System and other areas determined by the Engineer (flood zones) shall have all drain holes plugged prior to installation. Hydrants shall be rotatable in a minimum of eight (8) position in 360 degrees. All hydrants shall have two (2)- two and one half (2 1/2) inch hose nozzles and one (1) steamer or pumper connection threaded to conform to Northern Kentucky Water District Standards: steamer nozzle shall be National Standard Thread and 2 1/2" outlets shall be Northern Kentucky Water District Standard Thread (Old Cincinnati Thread). The operating nut and the nuts of the nozzle caps shall be square in shape, measuring one (1) inch from side to side. Hydrant body shall be painted yellow for areas designed for 150 psi working pressure and red for areas in excess of 150 psi. Hydrants used in areas in excess of 150 psi working pressure shall be designed to operate at the higher pressures and shall have independent operating valves on each 2 1/2" outlet.

All hydrants shall be right hand open, clockwise, except in certain areas of Campbell Co. as specified in Standard Drawings and shall have a direction arrow of operation cast into the dome of the hydrant. Installation per Standard Drawing #109.

C. **INSTALLATION.** The installation of fire hydrants shall be in conformance with "Mains Installation" section, paragraph "Setting Hydrants".

D. **Polyethylene Encasement** Fire hydrant tee, anchoring pipe and part of the fire hydrant shoe shall be encased with Polyethylene film conforming to ANSI A21.5 (AWWA C105). (See Standard Drawing #109)

7. **VALVES**

- A. DESCRIPTION. The Contractor shall provide all labor, materials, tools, and equipment required to furnish and install in good workmanlike manner all valves and accessories complete and ready for service where shown on the plans or where directed by the Engineer and as specified herein.
- B. GATE VALVES. Gate valves shall conform to AWWA C509 and shall be cast iron or ductile body, resilient wedge, non-rising stem with rubber "O" ring packing seals. All external dome and packing bolts shall be stainless steel. The valves shall open by turning counter-clockwise. All valves shall have openings through the body of the same circular area as that of the pipe to which they are attached. Valves shall have mechanical joint ends unless otherwise shown on the plans or directed by the District. All valves shall be designed for a working pressure of 250 pounds per square inch (PSI) unless otherwise noted on the plans or in the "Supplemental Specifications". An extension stem shall be furnished if required, to bring the operating nut within 3-1/2 feet of finished grade. Extension stems shall be securely fastened to the valve stem. The Contractor shall make all valves tight under their working pressures after they have been placed and before the main is placed in operation.
- C. TAPPING SLEEVES AND VALVES. Tapping sleeves and valves shall be designed for a working pressure of 250 psi. The tapping sleeve together with the tapping valve shall be tested at 250 psi for visible leakage and pressure drop before the main is tapped. Tapping sleeve and valve used in high pressure areas shall be tested at 350 psi.
1. Tapping Sleeves Tapping sleeves shall be two piece with mechanical joint type ends, and be so designed as to assure uniform gasket pressure and permit centering of the sleeve on the pipe.
 2. Tapping Valves Tapping valves shall have a flange on one end for bolting to the tapping sleeve and a mechanical joint type end connection on the outlet with slotted standard flange or other adapters for connection to the tapping machine. All external dome, flange and packing bolts shall be stainless steel. The valves shall open by turning counterclockwise. Tapping valves shall conform to AWWA C509.
- D. VALVE BOXES All valves shall be provided with valve boxes. Valve boxes shall be of standard, adjustable, heavy duty cast iron extension type, two piece, 5 1/4 inch shaft, screw type, and of such length as necessary to extend from valve to finished grade, Tyler #562-S, Tyler #564-S or approved equal. Valve box cover shall be stamped "Water". Tops shall be set at final established grade.
- E. BUTTERFLY VALVES. Unless otherwise specified valves 16 inches and larger shall be butterfly valves rated at 250 psi working pressure and conform to the applicable portions of AWWA Standard C504, latest edition.
1. Body - The valves shall be AWWA Class 250B designed for tight shut-off against a differential pressure of 250 psi. Valve bodies shall be constructed of ductile iron. Two trunnions for shaft bearing shall be integral with the valve body. The valves and appurtenances shall be suitable for buried service.
 2. Ends - Valves shall have mechanical joint ends and shall be furnished with high strength COR-10 tee head with hex nuts, ductile iron glands, and rubber gaskets for each mechanical joint end.

3. Discs - Valve discs of cast steel, fabricated steel, or cast bronze are not acceptable.
4. Seats - Seats bonded on the discs are not acceptable.
5. Shaft Seals - If stuffing boxes are utilized for shaft seals they shall be constructed of cast iron, ASTM A126. Gland assemblies shall be of cast bronze, ASTM B132. The packing gland shall be housed in a solid walled cast iron, ASTM A48, Class 40 one piece structure or equal.
6. Operators - The valve operating mechanism shall be for counterclockwise opening. There shall be no external moving parts on valve or operator except the operator input shaft. Input shaft is to be operated by a 2 inch square operating nut. Maximum required input force on the operator shaft to open and close the valve shall be 40 pounds. The total number of turns applied to the operating nut required to completely open the valve from a completely closed position shall not be less than twice the normal valve diameter. An extension stem shall be furnished to bring the operating nut within 3 1/2 feet of the finished grade. Extension stems shall be securely fastened to the valve stem.
- E. VALVE BOXES All valves shall be provided with valve boxes. Valve boxes shall be of standard, adjustable, heavy duty cast iron extension type, two piece, 5 1/4 inch shaft, screw type, and of such length as necessary to extend from valve to finished grade, Tyler #562-S, Tyler #564-S or approved equal. Valve box cover shall be stamped "Water". Tops shall be set at final established grade.
- F. AIR RELEASE AND VACUUM VALVES. Air release valves shall be constructed at high points in the water line as indicated on the plans. These valves shall permit the air in the pipeline to escape as the pipe line fills and allows the air to re-enter as the line empties. These valves shall be APCO Air Release Valves Model #200-A, 250 psi working pressure, 1", cast iron body and cover. 16" and larger water mains shall be a 2" air release valve and curb stop. Refer to Standard Drawing #106 for reference.

8. **STEEL CASING PIPE**

Casing pipe shall be steel pipe with a minimum yield strength of 35,000 psi with a minimum wall thickness as listed below:

Nominal Diameter Casing Pipe	Normal Wall Thickness	Nominal Diameter Casing Pipe	Normal Wall Thickness
Under 350 mm (14")	0.251"	650 mm (26")	0.438"
350 & 400 mm(14"&16")	0.282"	700 & 750 mm(28"&30")	0.469"
450 mm (18")	0.313"	800 mm (32")	0.501"
500 mm (20")	0.344"	850 & 900 mm(34"&36")	0.532"
550 mm (22")	0.375"	950 – 1050mm(38,40&42")	0.563"
600 mm (24")	0.407"	1200 mm (48")	0.626"

The inside diameter of the casing pipe shall be at least 100 mm (4") greater than the outside diameter of the carrier pipe joints. Steel casing sections shall be connected by welding, conforming to AWWA C206.

Adequate pipe spacers shall be installed to ensure that the carrier pipe is adequately supported in the center of the casing pipe throughout it's length, particularly at the

ends. There shall not be any metallic contact between the casing and carrier pipe. Casing shall be backfilled with pea gravel or sand after the carrier pipe is installed to prevent pipe movement. Casings shall have both ends sealed up in such a way as to prevent the entrance of foreign material. See Standard Drawing #104 for installation details.

9. **MATERIAL APPROVAL** Material certification and test samples shall be provided by the Contractor, at the contractors expense, as required by Northern Kentucky Water District and the Kentucky Department of Highways. No material shall be used until approved. All rejected material be removed from the project and approved material acquired by the Contractor at the Contractor's expense.
10. **PAVING MATERIALS FOR REPLACEMENT IN KIND** All materials for replacement in kind of streets, sidewalks, curbs, walls etc. shall meet the requirements of the applicable sections of KYDOH Standard Specifications For Road And Bridge Construction.
11. **FLOWABLE FILL** This material shall meet the requirements of SPECIAL NOTE 7X of the Kentucky Department of Highways' Standard Specifications for Road and Bridge Construction.

CONSTRUCTION

- A. **GENERAL** Installation of water mains and appurtenances shall conform to the latest edition of AWWA Standard C600 for D.I.P.

Water main pipe and fittings shall be laid on a good level foundation with no gaps or humps under the pipe or fittings. Excavation shall be done by hand at joints to prevent the pipe and fittings from being supported by the mechanical joint or slip joint bell. Pipe shall be laid with the bell ends facing in the direction of laying.

The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations. ALL OPEN ENDS ARE TO BE CLOSED WITH CAPS OR PLUGS AT ALL TIMES WHEN PIPE LAYING OPERATIONS ARE NOT IN OPERATION AND AT THE END OF THE DAY. All caps or plugs shall be properly installed and blocked in advance of filling, flushing, and testing mains. All securing and blocking shall be inspected by the Engineer prior to backfilling of ditch.

- B. **HANDLING**. Pipe, fittings, valves, hydrants and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against other pipe. Pipe hooks that extend inside the ends of the pipe shall not be used for handling the pipe since they could damage the lining. Under no circumstances shall such materials be dropped. The interior of all pipe, fittings and other accessories shall be kept free from dirt and foreign material at all times. When handling P.V.C. pipe care should be taken to avoid abrasion damage, gouging of the pipe, rocks, and any stressing of the bell joints or damage of the bevel ends.
- C. **TREE REMOVAL**. Stumps of trees designated for removal 12" in diameter and smaller shall be physically removed. Any stump larger than 12" shall be ground down to 6" below final grade level.
- D. **DEWATERING**. Should water be encountered, the Contractor shall furnish and operate suitable pumping equipment of such capacity adequate to dewater the trench. The trench shall be sufficiently dewatered so that the laying and joining of the pipe is made in the dry. The Contractor shall convey all trench water to a natural drainage channel or storm sewer without causing any property damage.
- E. **CONSTRUCTION EQUIPMENT**. Where mains are located in or adjacent to pavements, all backfilling and material handling equipment shall have rubber tires. Crawler equipment shall be permitted when there is no danger of damaging pavement.
- F. **TRENCH SUPPORT**. Supporting open cuts for mains shall be the responsibility of the Contractor where trenching may cause unnecessary damage to street pavement, trees, structures, poles, utilities, or other private or public property. During the progress of the work, whenever and wherever it is necessary, the Contractor shall, at his expense, support the sides of the excavation by adequate and suitable sheeting, shoring, bracing, or other approved means. Such trench support material and equipment shall remain in place until backfilling operations have progressed to the point where the supports may be withdrawn without endangering property.

G. NOISE DUST AND ODOR CONTROL. The Contractor's construction activities shall be conducted so as to eliminate all unnecessary noise, dust and odors.

H. DISINFECTION AND LEAKAGE TESTING. See Section "Disinfection and Leakage Testing."

I. TRENCH EXCAVATION AND BOTTOM PREPARATION.

1. General. The Contractor shall perform all excavation of every description and of whatever substances encountered to the depths indicated on the drawings or as otherwise specified. During excavation material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and wasted at a site acquired by the Contractor and approved by the Engineer. Topsoil shall be stripped from the excavation area before excavation begins.

Such grading shall be done as may be required to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or other approved methods. The trench shall be sufficiently dewatered so that the laying and joining of pipe is made in the dry. The Contractor shall take whatever action necessary to insure that water pumped from the trench will not damage private property. If necessary the Contractor shall haul trench water to another suitable location for disposal.

Such sheeting and shoring shall be furnished and installed by the Contractor, at his own expense, as may be necessary for the protection of the work, protection of other utilities, protection of structures, the safety of the personnel, and the safety of the public. All shoring shall be removed when the work is completed unless directed otherwise by the Engineer. The Contractor shall also furnish whatever barricades or fencing necessary to provide for the safety of pedestrians in excavation areas and for traffic control as discussed in other sections. All open trenches shall be adequately covered, barricaded and/or backfilled during non-working hours in order to adequately protect vehicular and pedestrian traffic.

The Contractor shall excavate whatever material encountered. Trenches shall be excavated to the widths shown in the table headed "Trench Width" or as otherwise indicated in the plans, and the banks shall be as nearly vertical as practicable. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe or conduit on undisturbed soil at every point along its entire length, except for bell holes and for the proper sealing of the pipe joints. Bell holes and depressions in order that the pipe rest upon the prepared bottom for as nearly its full length as practicable, shall be only of such length, depth, and width as required for properly making the particular type of joint. Additional depth shall be excavated in rock as described elsewhere herein.

Except in cases where the elevations of the water lines are indicated on the plans, trenches for water line shall be of a depth that will provide a minimum cover over the top of the pipe of 36 inches from the indicated finished grade, and avoid interference of the water lines with other existing or proposed utilities. Where the note occurs, "Slope to Drain", the Contractor shall manage to keep a positive slope in that direction in order that air may travel to the air vent. Where paved surfaces are to be disturbed by an open cut,

the Contractor shall provide suitable machinery to cut the edges of the pavement in a smooth straight line.

2. Rock The word "rock" wherever used as the name of an excavated material, shall mean boulders and solid masonry larger than 1/2 cubic yard in volume, or solid ledge rock and masonry which, in the opinion of the Engineer, requires for its removal, drilling and blasting, wedging, sledging, barring, or breaking up with a power operated hand tool. Any material which can be excavated using a hand pick and shovel, power operated excavator, power operated backhoe or power operated shovel shall not be defined as rock.
3. Blasting Rock. No blasting of rock shall be done within 40 feet of pipes or structures without specific permission from the Engineer. Blasts shall be properly covered and the pipe or structure properly protected. Warnings shall be given to all persons in the immediate vicinity. Blasting shall be at the risk of the Contractor who shall be liable for all damages to persons or property. Necessary permits shall be secured and paid for by the Contractor.
4. Trench Width. Widths of trenches shall be held to a minimum to accommodate the pipe and appurtenances. The trench width shall be measured at the top of the pipe barrel and shall conform to the following limits:

Earth

- a. Minimum - outside diameter of the pipe barrel plus 8 inches, 4 inches each side of pipe.
Maximum - nominal pipe diameter plus 24 inches.

Rock

- Minimum – 24" or less, nominal pipe size: outside diameter of pipe barrel plus 12", @ 6" each side.
Minimum - Larger than 24", nominal pipe size: outside diameter of pipe barrel plus 18", @ 9" each side.
Maximum - nominal pipe diameter plus 24".

- b. Butterfly Valves. Trench width shall be over excavated 24" on the side that the operating mechanism is located on the butterfly valve when the surrounding area cannot be hand dug.
 - c. Structures. The minimum excavation limits for structures shall be as indicated. In rock, the excavation limits shall not exceed 12 inches from the outside wall and 6 inches below the footer.
5. Excessive Trench Width. If, for any reason the trench width exceeds the maximum trench width defined in paragraph "Trench Width", the Contractor, subject to approval of the Engineer, shall provide compacted stone bedding, additional strength pipe or concrete encasement, at the contractor expense.
 6. Bottom Preparation The Contractor shall use excavation equipment that produces an even foundation. For the entire length of the trench, a compacted layer of sand or bankrun bedding material shall be installed below the pipe. Bell holes and depressions for joints, valves, and fittings shall be dug after the trench bedding has been graded in order that the pipe rest upon the prepared bedding for as nearly its full length as

practicable. Bell holes and depressions shall be only of such length, depth, and width as required for properly making the particular type of joint.

- a. Earth. The trench shall be excavated to the depth required, so as to provide a uniform and continuous bearing and support for the pipe barrel. A minimum of 3" sand shall be installed on the solid and undisturbed ground. The finished trench bottom shall be accurately prepared by means of hand tools.
 - b. Rock. Where excavation is made in rock or boulder, the trench shall be excavated 6 inches below the pipe barrel for pipe 24 inches in diameter or less, and inches for pipe larger than 24 inches in diameter. All loose material shall be removed from the trench bottom. After preparation of the trench bottom, a pipe bed shall be prepared using sand and thoroughly compacted. The bedding material shall be spread the full width of the trench bottom.
7. Water Main Depth. Mains 12" and less in size shall be not less than 36" in depth and no more than 48" in depth, unless otherwise specified. Mains larger than 12" shall be installed as shown on the plans.
 8. Excessive Trench Depth. If, for any reason, the trench depth exceeds the trench depth shown on the Plans, the Contractor is responsible for any and all additional cost incurred for the excessive depth.
 9. Foundation. The mains are to be built on a good foundation. If, in the Engineer's opinion, the material forming the trench bottom is not suitable for a good foundation, a further depth shall be excavated and the same filled with suitable material. Unauthorized excavation below the trench bottom shall be filled with compacted crushed stone at the Contractor expense.

J. PIPE, VALVE AND HYDRANT INSTALLATION The provisions of AWWA C600 shall apply in addition to the following:

1. Pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work except when permitted by the Engineer. Unless otherwise indicated in the plans or in Section I, Bid Item Explanations, the material shall be new and unused. The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved methods. Pipe shall be laid with bell ends facing in the direction of laying, unless otherwise directed by the Engineer. After placing a length of pipe in the trench, the spigot end shall be centered in the bell of the pipe and forced home. All pipe shall be laid with ends abutting and true to line and grade. Deflection of pipe joints in excess of the manufacturer's recommendations will not be permitted. A watertight pipe plug or bulkhead shall be provided and used to prevent the entrance of foreign material whenever pipe laying operations are not in progress. Any pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Any section of pipe found to be defective before of after laying shall be removed and replaced at the Contractor's expense.
2. Pipe Cutting. The cutting of pipe for installing valves, fittings, or hydrants shall be done in a neat and workmanlike manner without damage to the pipe or lining. The end shall be smooth and at right angles to the axis of the pipe. Flame cutting of metal pipe by means of an oxyacetylene torch shall not be permitted. All pipe cutting shall be at the Contractor's expense.

3. Push-On Joints. The surfaces with which the rubber gaskets comes in contact shall be thoroughly cleaned just prior to assembly. The gasket shall then be inserted into the groove in the bell. Before starting joint assembly, a liberal coating of special lubricant shall be applied to the spigot end. (Special lubricant shall be suitable for use in potable water) With the spigot end centered in the bell, the spigot end is pushed home.
4. Mechanical Joints. Mechanical joints require that the spigot be centrally located in the bell. The surfaces with which the rubber gasket comes in contact shall be thoroughly cleaned just prior to assembly. The clean surfaces shall be brushed with a special lubricant just prior to slipping the gasket over the spigot end and into the bell. (Special lubricant shall be suitable for use in potable water) The lubricant shall also be brushed over the gasket prior to installation to remove the loose dirt and lubricate the gasket as it is forced into its retaining space. P.V.C. pipe spigot ends shall be field cut smooth and at right angles to the axis of the pipe for installation in mechanical joint fittings.

1. Bolt Torque The normal range of bolt torque to be applied to standard cast iron bolts in a joint are:

Range of Torque Size in foot-pounds	
5/8"	40 - 60
3/4"	60 - 90
1"	70 - 100
1-1/4"	90 - 120

5. Restrained Joints
- a. Ball and Socket. Ball and Socket joints shall be assembled and installed according to the manufacturers recommendations. The joint shall be thoroughly cleaned and lubricated. Check the retainer ring fastener. After installation, all slack shall be taken out of the pipe joint.
- b. Push-On. Assemble and install the push-on joint according to the manufacturer's recommendations. Restrained joint-type pipe and fittings shall only be used as approval by the Engineer. Retaining glands, field lock gaskets, or retaining flanges shall not be considered as providing a restrained joint. The joint shall be thoroughly cleaned and lubricated. Check the retainer ring fastener. After installation, all slack shall be taken out of the pipe joint.
6. Setting Valves. Valves shall be set on a firm solid concrete block foundation so that no load will be transferred to the connecting pipe. Valves in water mains shall, where possible, be located on the street property lines extended, unless otherwise shown on the plans. A valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve. The box cover shall be set flush with the surface of the finished pavement unless otherwise shown. All valves boxes with the exception of isolating valves for fire hydrants that are located in non-paved areas shall have a minimum of 2'x2'x4" concrete pad as shown in Standard Drawing No. 105.
7. Setting Hydrants. Hydrants shall be located as shown on the plans or as directed by the Engineer. The location shall provide complete accessibility and minimize the possibility of damage from vehicles or injury to pedestrians. All hydrants shall stand plumb with the pumper nozzle facing the curb. Hydrant shall be set to the established grade, with the

traffic flange within 100 mm (4") above final grade in accordance to Standard Drawing No. 109. Each hydrant shall be controlled by an independent gate valve with valve box. All valves used for hydrant control shall be anchored to the branch tee.

8. Thrust Blocking. All bends over five (5) degrees, plugs, caps, and tees shall be securely blocked against movement with concrete thrust blocks placed against undisturbed earth in accordance with Standard Drawing No. 104. Thrust blocks shall be approved by the Engineer prior to backfilling. Water mains shall have concrete thrust block at all pipe intersections and changes of direction to resist forces acting on the pipeline. All concrete thrust blocks shall be poured in such a manner that the bolts can be replaced without disturbing the blocking.

All caps or plugs used in mains to undergo hydrostatic test shall be properly installed and blocked in advance of testing mains. All caps or plug installations shall be approved by the Engineer's representative before the main is subjected to the pressure test.

- a. Concrete Blocking. Concrete blocking shall be K.D.O.T. Class A concrete as specified in Section "Concrete". Blocking shall be placed between undisturbed ground and the fitting to be anchored. The area of bearing on the fitting and on the ground in each instance shall be that shown herein. The blocking shall, unless otherwise shown, be so placed that the pipe and fitting joints will be accessible for repair.
- b. Tie Rods. If shown or specified, movement shall be prevented by attaching suitable metal rods, clamps or restrained fittings. Steel tie rods or clamps, where permitted, shall be of adequate strength to prevent movement. Steel tie rods or clamps shall be painted with three coats of an approved bituminous paint or coal tar enamel. A minimum of 3/4" welded eye bolts @ a 90 degree bend and 3/4" threaded rods may only be used with the approval of the Engineer for temporary restraint only. Duc-Lucs are prohibited for use.
- c. Restrained Fittings. Restrained fittings, where permitted, shall be subject to the approval of the Engineer.

K. TRENCH BACKFILL

All trench backfill shall be free from cinders, refuse, organic material, boulders, rocks or other material which in the opinion of the Engineer is unsuitable. No backfill shall be made with frozen material.

1. BACKFILL

- a. Trench Bottom Preparation. The pipe shall be bedded on sand to achieve full pipe barrel support. In any event not less than 3" of sand bedding shall be used.
- b. Backfill to 12" Over Pipe Barrel. All trench excavations shall be backfilled immediately after pipe is laid with the exception of thrust blocks. Compacted sand shall be used to backfill the trench from the bottom of the pipe barrel to the 12" over the pipe barrel. No flushing of backfill shall be permitted to achieve compaction. Clay bulkheads shall be installed as specified under Bulkheads Section.
- c. Remaining Trench Backfill. From 12" above the pipe barrel to the surface, excavated trench material or flowable fill may be used as backfill material. No material shall be

used for backfill that contains frozen earth, vegetation or organic material, debris, rocks 8" or larger measured in any direction, or earth with an exceptionally high void content.

- d. Compaction. All backfill shall be placed in uniform loose layers, not to exceed 12" layers, and each layer shall be compacted to a density not less than 95 percent of the standard Proctor maximum dry density (ASTM D698). The backfill shall be compacted in such a manner and with appropriate equipment so that there is no pipe damage, pipe misalignment or damage to joints. No flushing of backfill shall be permitted to achieve compaction.
- e. Bulkheads. When a granular bedding is provided in rock or when granular backfill is used, the Contractor shall place bulkheads of clay soil across the trench at 100' intervals to resist the movement of groundwater through the granular material. Such bulkheads shall be carefully compacted and shall extend approximately 3 feet in a direction parallel to the pipe and shall extend from the bottom of the trench to a point 4" below final grade level.
- f. Flowable Fill as Backfill As required by the Engineer, flowable fill shall be per Special Note 7X of the Ky. Department of Highways Standard Specifications for Road and Bridge Construction.
- g. Surface Conditions. The trench surface shall be periodically attended to during the course of the contract. The trench surface shall be maintained in a safe condition and shall not interfere with natural drainage.

- L. INSTALLATION OF PIPE BY BORING OR JACKING. At certain locations where designated on the plans, the Contractor will be required to install pipe under paved areas or other obstacles by boring a hole large enough to pull the pipe through without obstructing the designated area, or by jacking, whichever is the most feasible.
- M. WATER METERS Water Meters shall be installed at locations shown on the plans. The meter shall be constructed as shown on Standard Drawings contained herein or in the plans.
- N. CONNECTIONS (TIE-INS) TO EXISTING WATER LINES All connections to existing water lines shall be made at location shown on the plans. Care shall be taken in each case that none of the sterilizing water may enter the system during the sterilizing operation. Each connection shall be preceded with a one inch corporation stop and drain to allow bleeding of the water line of air and sterilizing water. This corporation stop shall be furnished and installed at the Contractor's expense. All sections of pipe and appurtenances to be used for tie-ins and not sterilized, shall be thoroughly cleaned by scrubbing with a chlorine solution prior to installation. All tie-ins of mains shall be done with transitional or straight solid sleeves. Mains shall be flushed of sterilizing water before tie-ins to existing mains are made.
- O. INSTALLATION OF SERVICE LINES Service line shall be installed as shown on the plans or as directed. The Contractor shall excavate whatever material encountered. The service lines shall be installed using boring and jacking or open cut (as specified on the plans) at the depth required to clear existing and proposed sewers, but in no case shall the line be installed with less than 36" cover from final grade. The trench width shall be as excavated to a maximum of 2'. The line shall be laid on firm soil. In rock, sufficient extra depth shall be excavated and refilled with acceptable compacted soil or bedding sand to provide a cushion for the elimination of the possibility of crushing or perforating the pipe. Connections shall be made using normal practices for water line installation and in accordance with the standards

in the plans or contained herein. Backfill shall meet the same requirements as that described in PIPE TRENCH BACKFILL.

- P. **TEMPORARY SERVICE CONNECTIONS** Contractor shall furnish, install, make connections, and maintain all temporary lines and other appurtenances necessary to run temporary service connections as needed to permit construction. All temporary service pipes crossing streets, commercial driveways, and/or wheelchair ramps must be buried to prevent a traffic/pedestrian hazard.

The pipe, hoses and other materials furnished by the Contractor for use as temporary service pipe, shall be clean, water-tight and fully adequate to withstand existing pressures and all other conditions of use.. Care shall be exercised throughout the installation of all temporary pipe and service fittings to avoid any possible contamination of any mains or house services or contamination of the temporary pipe proper. Contractor must disinfect all temporary line. All temporary lines must be flushed before being hooked to service line.

The Contractor shall be responsible for the regularly testing and recording the chlorine level of the temporary lines. If low levels are encountered, the Contractor shall be responsible for flushing the line to get levels into standard. The Contractor shall perform all connecting and disconnecting of temporary bypass to consumers' services and all back clearing of service lines.

The Contractor shall maintain the temporary water service line in safe and operative condition at all times. Any temporary bypass lines or services crossing a sidewalk or driveway shall be temporarily covered with a rubber ramp provided by the Contractor or bituminous cold patch, compacted by a roller or a mechanical compaction device, provided by the Contractor. Ramping method must be approved by the District prior to use. The Contractor shall be responsible for the maintenance of the temporary ramping method and any damage as a result there-of.

Q. **APPLICABLE SPECIFICATIONS & STANDARDS**

The following specifications and standards form a part of these Specification:

- A. **American Water Works Association** (AWWA) Standards
- B. **Northern Kentucky Water District** Standards Drawing & Specifications
- C. **"Manual of Accident Prevention in Construction"** published by the **Associated General contractors of America**
- D. **Kentucky Occupational Safety and Health Administration's** "Kentucky Occupational Safety and Health Standards for General Industry" current edition.
- E. **American National Standards Institute** (ANSI)
- F. **American Society for Testing & Materials** (ASTM)
- G. **Kentucky Division of Water Quality**
- H. **"Recommended Standards for Water Works"** current edition

DISINFECTION AND LEAKAGE TEST

- A. **SCOPE.** This section covers the disinfection of the new water mains, fittings, temporary services and associated appurtenances. The Contractor shall provide all labor, materials, tools, equipment, and incidentals required to test the mains for watertightness and disinfect the mains as directed by the District and as specified herein. Gauges for the test shall be furnished by the Contractor.
- B. **TEST SECTION.** After the main has been installed and backfilled all newly installed pipe or any valved section thereof shall be considered a test section.
- C. **WITNESS.** All tests performed for each test section shall be witnessed and approved by the District before acceptance. In the event the Contractor performs any test without witness by the District, the Contractor will be required to test the section again in conformance with this specification at no cost to the District.
- D. **GENERAL.** All disinfection work shall conform to the requirements of the latest revision of ANSI/AWWA C651 and the requirements of the Kentucky Division of Water. If any State requirements conflict with the provisions of this section, the State requirements shall govern.

Water required for flushing and disinfection work will be provided as stipulated in the temporary facilities.

When it is necessary to interrupt service to water customers, each customer affected shall be notified in advance of the proposed service interruption and its probable duration in accordance with the project requirements.

- E. **DISINFECTION PROCEDURE.** During construction or after the installation of the pipe and fittings is complete, an approved disinfection method, according to governing standards, shall be used. The disinfection solution shall be allowed to stand in the main and associated appurtenances for a period of at least twenty-four (24) hours.

During disinfection, all valves, hydrants, and service line connections shall be operated to ensure that all appurtenances are disinfected. Valves shall be manipulated in such a manner that the strong disinfection solution in the main from flowing back into the supply line. Check valves shall be used if required.

All non-disinfected fittings used for tie-ins or repairs shall be cleaned and swabbed with a liquid sodium hypochlorite disinfecting solution prior to installation.

- F. **FINAL FLUSHING.** Upon completion of chlorination but before sampling and bacteriological testing, Contractor shall remove all heavily chlorinated water from the main and temporary services by flushing with potable water at the maximum velocity which can be developed under the direction and control of the District.

The Contractor shall properly neutralize and dispose of the chlorinated water and flushing water in accordance with all applicable regulations. Contractor shall obtain all special waste disposal permits necessary.

- G. **DISPOSAL OF HEAVILY CHLORINATED WATER.** Contractor shall apply a de-chlorinating agent to the water to be wasted to neutralize thoroughly the chlorine

residual remaining in the water. (See the following table for neutralizing chemicals.) Federal, state, and local regulatory agencies should be contacted to determine special provisions for disposal of heavily chlorinated water.

Chlorine residual of water being disposed of shall be de-chlorinated by treating with one of the chemicals listed in the following table:

Pounds of Chemicals Required to De-chlorinate Various Residual Chlorine
Concentrations in 100,000 Gallons of Water*

Residual Chlorine Concentration <i>mg/L</i>	Sulfur Dioxide (SO ₂)	Sodium Bisulfate (NaHSO ₃)	Sodium Sulfite (Na ₂ SO ₃)	Sodium Thiosulfate (Na ₂ S ₂ O ₃ @5H ₂ O)
1	0.8	1.2	1.4	1.2
2	1.7	2.5	2.9	2.4
10	8.3	12.5	14.6	12.0
50	41.7	62.6	73.0	60.0

* Except for residual chlorine concentration, all amounts are in pounds.

The Contractor shall provide all necessary materials, equipment and labor for applying the de-chlorinating chemical in a manner such that proper mixing and contact time of the chemical and the heavily chlorinated water is obtained for complete removal of chlorine being flushed. The Contractor shall periodically test the flush water to verify that the chlorine residual is zero.

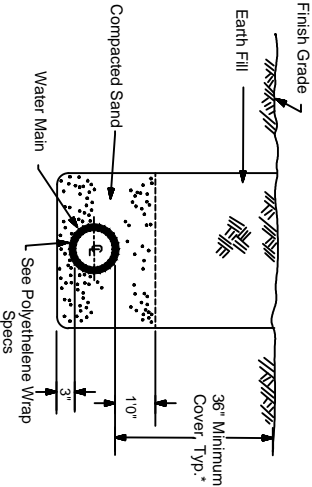
- H. **CHLORINE RESIDUAL TESTS.** Upon completion of final flushing, the District will perform chlorine residual tests to ensure the chlorine residual in the main and temporary services is not higher than that generally prevailing in the remainder of the water distribution system and is acceptable to the District.
- I. **BACTERIOLOGICAL TESTS.** Sampling and testing of water in the main and temporary services will be performed by the District after final flushing. A standard plate count will be made by the District for each sample.
- J. **REDISINFECTION.** Should the bacteriological tests indicate the presence of coliform organisms at any sampling point, the main and temporary services shall be re-flushed, re-sampled, and re-tested. If check samples show the presence of coliform organisms, the main and temporary services shall be re-chlorinated at no additional cost to the District until results acceptable to the District are obtained.

Re-disinfection shall be completed by the continuous feed or by the slug method. Unless otherwise permitted, the chlorination agent shall be injected into the main and temporary services at the supply end through a corporation cock installed in the top of the pipe. All materials, equipment and labor necessary for the re-disinfection shall be supplied by Contractor at no additional cost to the District.

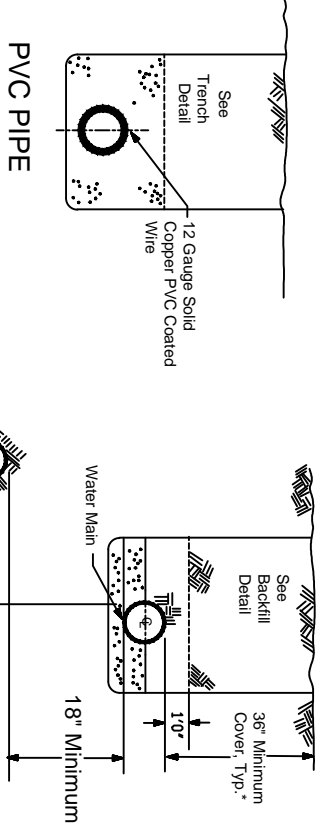
- K. HYDROSTATIC TESTING. Hydrostatic Testing will be in accordance with AWWA C600. The water main being tested shall have all air expelled by additional flushing or installation of taps on high points in the line. The pressure of the water main shall be gradually increased to obtain a minimum pressure of 100 psi over the design pressure 250 psi. at the lowest elevation point of the water main or as directed by the Engineer. The test will be for a two (2) hour duration and will not vary by more than 5 psi. All tests performed for each test section shall be witnessed and approved by a representative of the Engineer, in the event any test is performed without a representative of the Engineer, the Contractor shall be required to test the section again. Leakage is defined as the amount of water used to maintain the test pressure.

VEHICULAR AND PEDESTRIAN TRAFFIC CONTROL

1. **REFERENCE MATERIALS** Traffic shall be maintained in accordance with the "Manual on Uniform Traffic Control" published by the Federal Highway Administration, current edition of Kentucky Department of Highways Standard Specifications for Road & Bridge Construction and current KYDOH Standard Drawings.
2. **PEDESTRIAN TRAFFIC** Should the Contractor be required to remove sidewalk or any other pavement used by pedestrians, the Contractor shall construct an approved, safe, alternate route with acceptable paving materials. Approval for alternate routes and temporary paving materials shall be acquired from the Engineer. The Contractor shall also construct temporary barricades and fences as required. No extra payment will be made for construction of temporary pedestrian walkways, fences or barricades required for water line construction, but shall be considered incidental to water line construction.
3. **VEHICULAR TRAFFIC** Vehicular traffic shall be maintained as required by the referenced materials listed above. The cost of all temporary paving materials for pavement restoration due to water line construction shall be considered incidental to the contract. The cost for all traffic control materials including signs, barricades, etc. shall be considered incidental to the contract. The Contractor shall be required to keep the construction area safe at all times and check that traffic control devices are in place. Should temporary paving materials used for water line construction fail to perform satisfactorily, the Contractor shall repair same at his own expense.

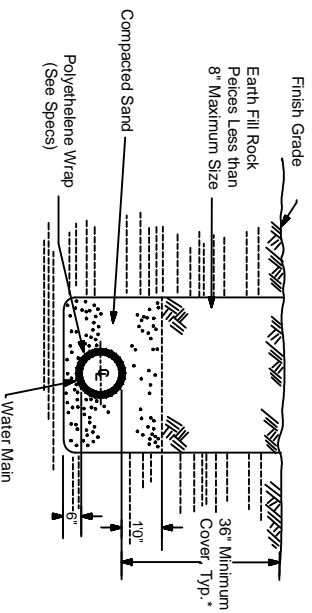


EARTH CUTS
TRENCH DETAIL

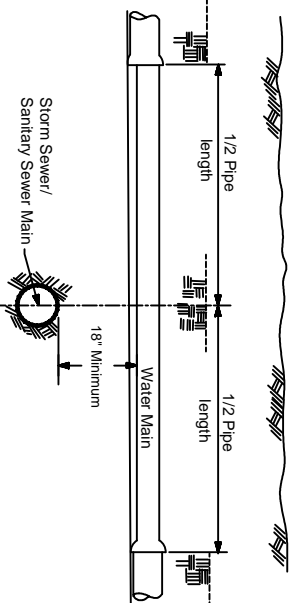


Water Main must be located a minimum of 10 feet lateral distance from any existing or future sewer lines or manholes, or as shown in the above alternate.

WATER MAIN PARALLELING
SEWER MAIN



ROCK CUTS
& UNSTABLE SUBGRADE
TRENCH DETAIL



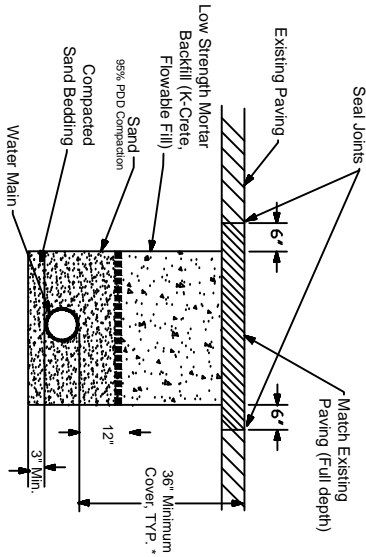
WATER MAIN CROSSING SEWER

ALTERNATE TO BE USED ONLY ON APPROVAL
BY THE DISTRICT

* Unless Otherwise Noted

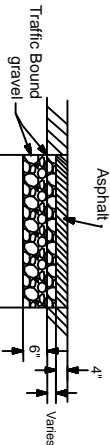
REVISION		BY	DATE
1	8" Max. Rock size	MPS	1/15/93
N. KY. WATER DISTRICT			
TYPICAL PIPELINE TRENCH			
DETAIL			
DRAWN BY: SAR			
APPROVED: RA			
DATE: 8/5/2014			
STANDARD DRAWING NO: 103			

UNDER ASPHALT CONCRETE
PAVEMENT

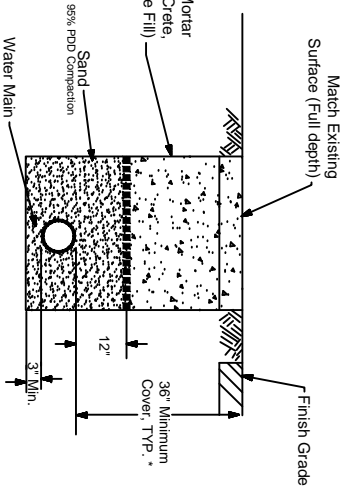


PDD= Standard Proctor Dry Density
-ASTM D698

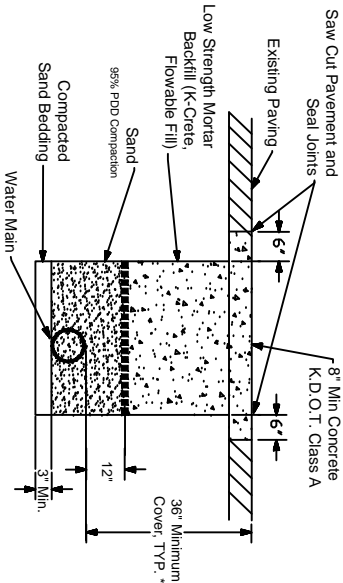
TEMPORARY STREET
RESTORATION



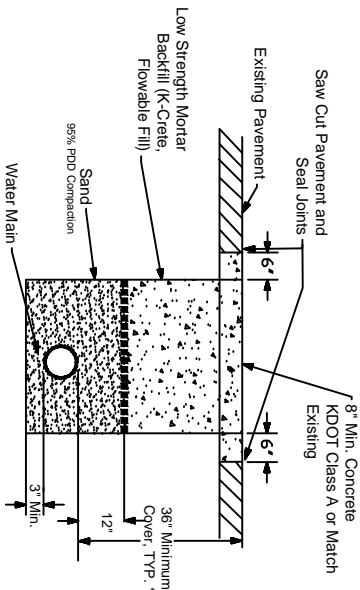
UNDER SHOULDER OF STATE
MAINTAINED STREET



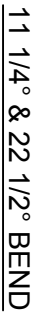
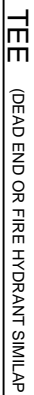
UNDER CONCRETE PAVEMENT



UNDER STATE MAINTAINED STREET
ALL CONSTRUCTION



REVISION		BY	DATE
1.	All streets low sligh mortar	MPA	10/30/95
N. KY. WATER DISTRICT			
TYPICAL PIPELINE TRENCH			
DETAIL			
DRAWN BY: SAR			
APPROVED: RA			
DATE: 8/5/2014			
STANDARD DRAWING NO: 103A			

150 PSI/250 PSI

* Distance to be 1/2" longer than entire length of the bolt used.

NOTES

- 1 DIP Fittings shall be per specifications.
- 2 Concrete to be 3500 psi.
- 3 All fittings to be Mechanical Joint.
- 4 Thrust bolts to be placed against undisturbed earth - use additional concrete as required for over excavation.
- 5 Blocking to be placed in a manner so that bolts can be removed without disturbing the block.

Blocking shall be poured after blue polyethylene wrap is in place.
Blocking shall be inspected by the District prior to backfilling.

N. KY. WATER DISTRICT
CONCRETE THRUST BLOCK
DETAIL

DRAWN BY:

APPROVED:

274

DATE: 04/25/2001

STANDARD DRAWING NO.

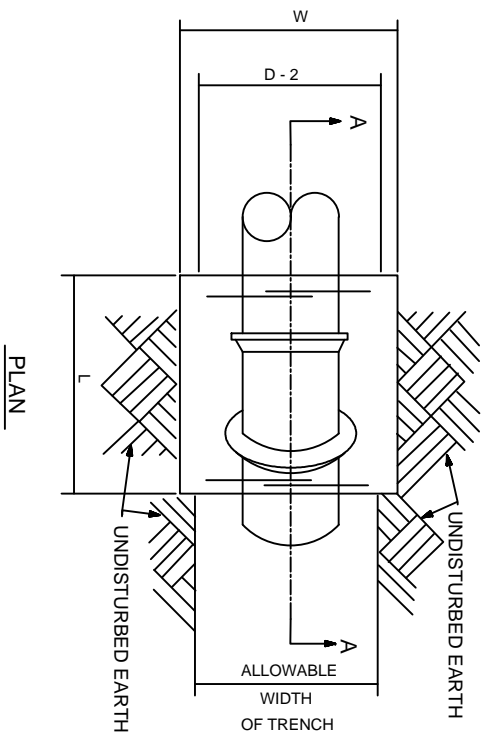
104




CONCRETE BACKING FOR VERTICAL BENDS

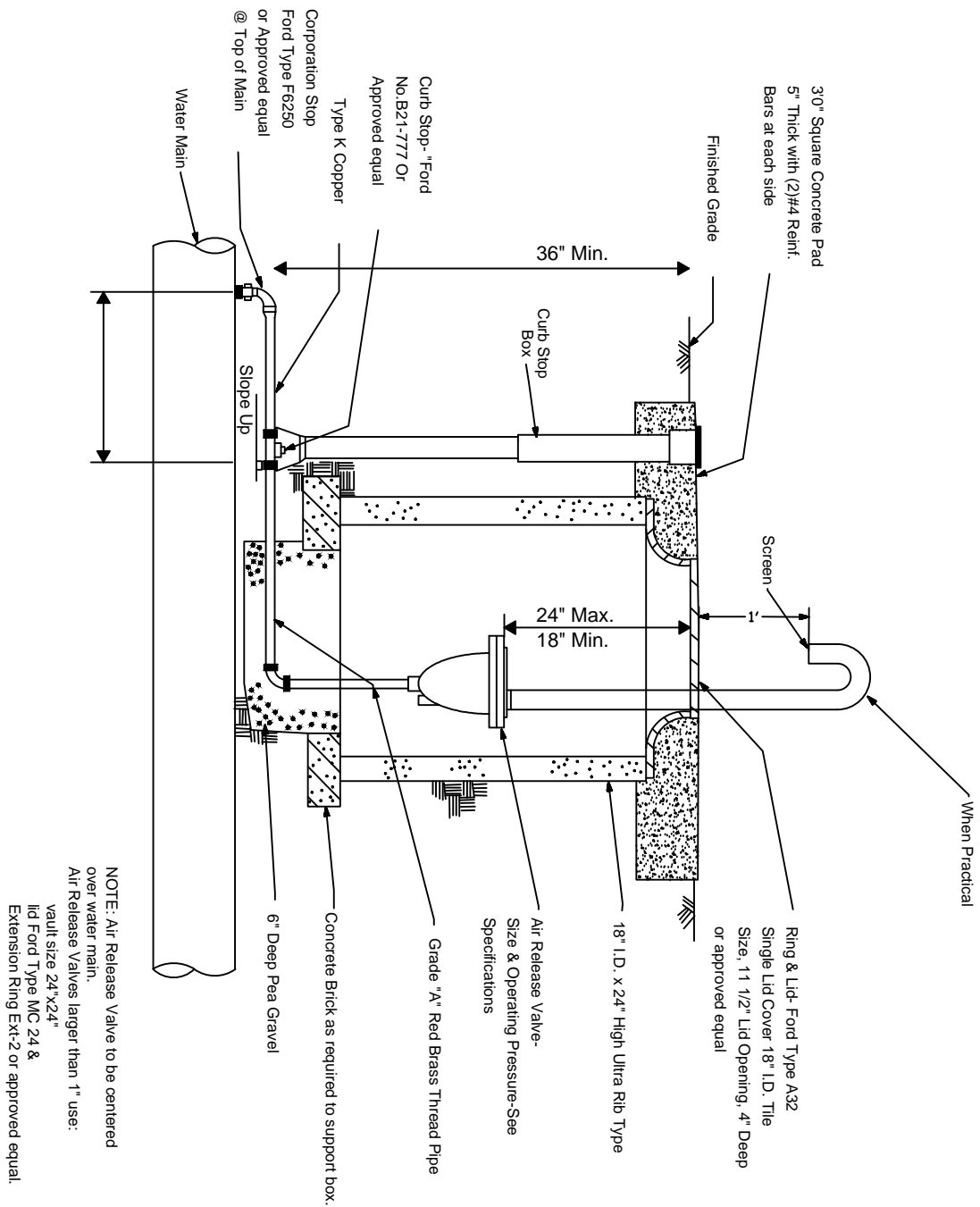
1. BACKING DESIGNED FOR 3000 POUNDS PER SQUARE FOOT SOIL BEARING AND 150 POUNDS PER SQUARE INCH INTERNAL PRESSURE.
 2. PROVIDE MINIMUM CONCRETE REINFORCEMENT OF 2 PAIR OF TWO 5" "U" BARS @ 12" C.
 3. CENTER BACKING ON BEND.
- BLOCKING FOR SIZES NOT SHOWN SHALL USE THE NEXT LARGER SIZE.

NOTE: VOLUMES GIVEN IN CUBIC FEET

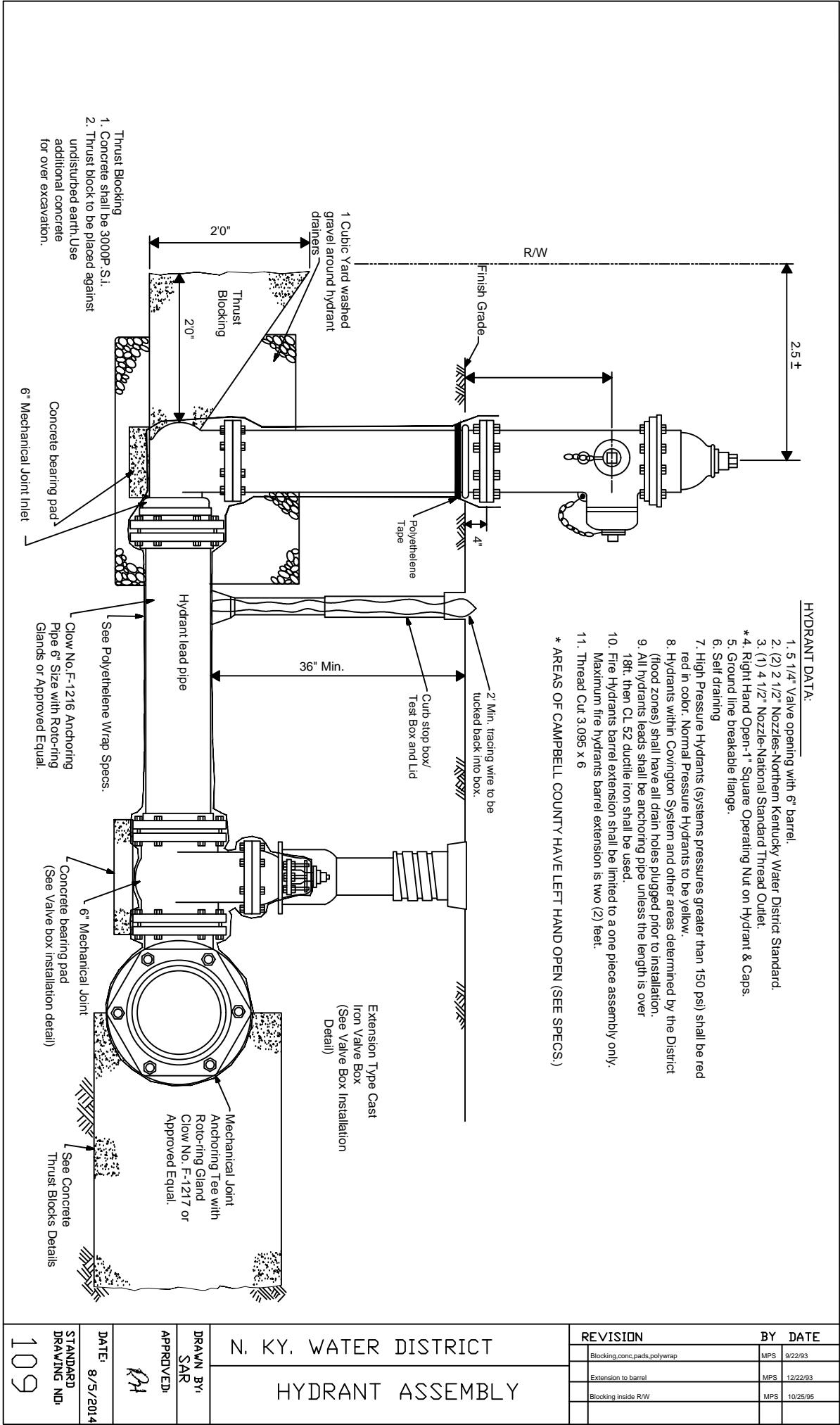


PLAN

DATE: 8/5/2014 STANDARD DRAWING NO: 104A	APPROVED: 	DRAWN BY: SAR	N. KY. WATER DISTRICT CONCRETE THRUST BLOCKING FOR VERTICAL BENDS	REVISION 1 2 3	BY 	DATE



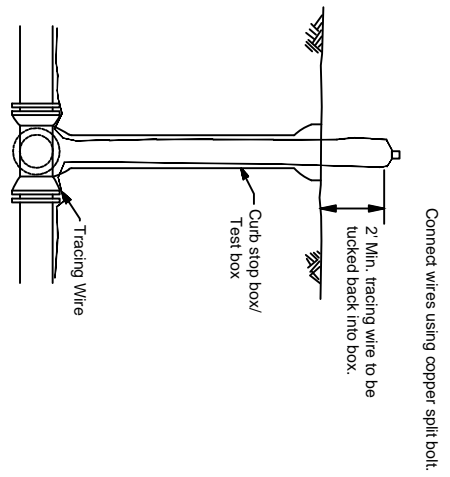
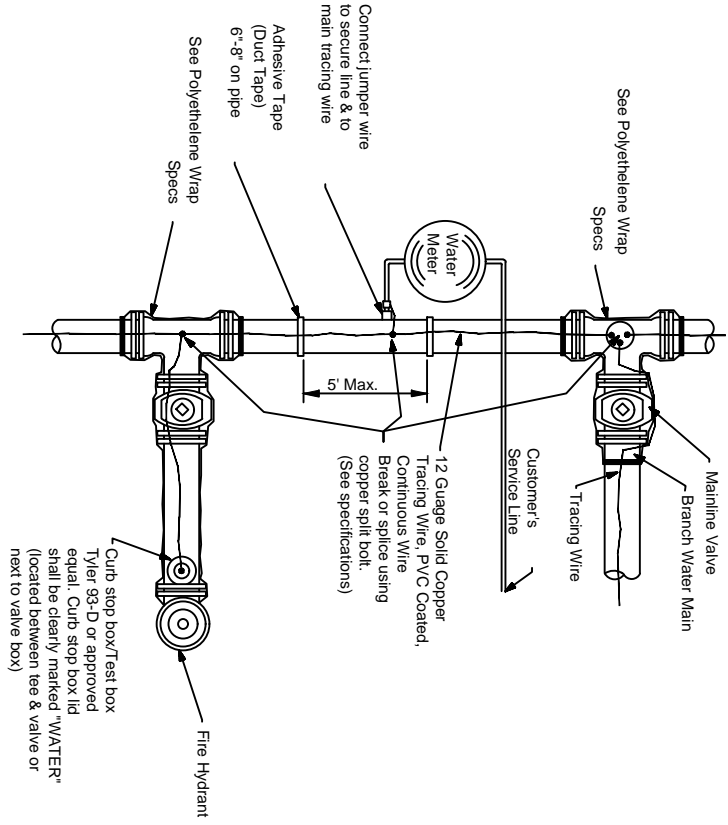
106	STANDARD DRAWING NO.	DATE: 8/5/2014	APPROVED: <i>RH</i>	DRAWN BY: SAR	N. KY. WATER DISTRICT	REVISION	BY	DATE
					N.KY WATER DISTRICT			
					AIR RELEASE VALE			



REVISION	BY	DATE
Blocking conc.pads.polywrap	MPS	9/22/93
Extension to barrel	MPS	12/22/93
Blocking inside R/W	MPS	10/25/95

N. KY. WATER DISTRICT
HYDRANT ASSEMBLY

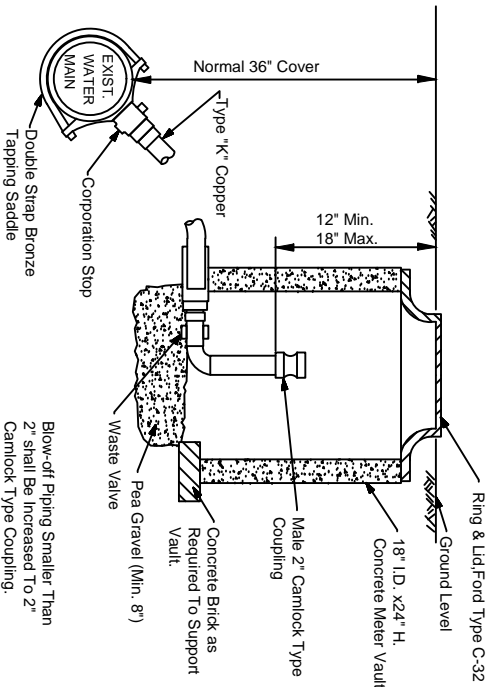
DRAWN BY: SAR	DATE: 8/5/2014
APPROVED: RH	STANDARD DRAWING NO. 109



Note: Curb stop box/test box shall not be installed in paved areas.


DUCTILE IRON AND PVC PIPE
WITH DUCTILE IRON FITTINGS

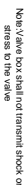
REVISION		BY	DATE
N. KY. WATER DISTRICT		TRACING WIRE INSTALLATION DETAIL	
DRAWN BY: SAR			
APPROVED: <i>RH</i>			
DATE: 8/5/2014			
STANDARD DRAWING NO:			
111			



TYPICAL FLUSHING DEVICE
INSTALLATION

N.T.S.

REVISION		BY	DATE
N. KY. WATER DISTRICT		TYPICAL FLUSHING DEVICE INSTALLATION	
DRAWN BY: SAR		APPROVED: 	
DATE: 8/5/2014		STANDARD DRAWING NO. 113	



Detail Valve Box Installation

Valve Box must not touch
valve body-2" space
desired here



Concrete Pads shall be constructed around all main line valve boxes except within hard paved areas. Concrete Pads shall be constructed around customer service line valve boxes 3" and larger valves.

ELEVATION

105

Standard Sanitary Sewer Bid Item Descriptions

S BYPASS PUMPING This item shall include all labor, equipment, and materials needed to complete a bypass pumping and/or hauling operation for diversion of sewage during sanitary sewer construction. Examples of such operations when bypass pumping and/or hauling may be necessary is during force main tie-ins, manhole invert reconstruction, insertion of new manholes into existing mains, or other similar construction. There may be more than one bypass pumping/hauling operation on a project. This item shall be paid for each separate bypass pumping/hauling operation occurrence as called out on the plans or directed by the engineer and actually performed. There will be no separate bid items defined for length, duration, or volume of sewage pumped or hauled in each occurrence. If a bypass pumping/hauling operation is called out on the plans; but, conditions are such that the bypass pumping/hauling operation is not needed or utilized, no payment will be made under this item. The contractor shall draw his own conclusions as to what labor, equipment, and materials may be needed for each bypass pumping/hauling occurrence. The contractor should be prepared to handle the maximum volume of the sewer being bypassed, even during a storm event. This item shall not be paid separately, but shall be considered incidental, when bypass pumping and/or hauling is needed during cast-in-place-pipe (CIPP) and/or point repair operations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

S CIPP LATERAL SERVICE INVESTIGATION This item shall include all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements and perform the identification, assessment and pre-measurement of all existing and abandoned laterals for the placement of Cured-In-Place-Pipe lining. This item shall be in payment for all lateral service investigation for all sewer segments to be lined as a part of this contract. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be LUMP SUM (LS).

S CIPP LATERAL REINSTATEMENT This item is to pay for installing a Cured-In-Place-Pipe liner in service laterals and service/mainline connections to stabilize structural defects and construction inadequacies. This bid item shall include all labor, equipment, materials and incidentals necessary to perform the service lateral reinstatement in accordance with the plans and specifications. Work under this item shall include sewer flow control, pre-installation cleaning, sealing connections to existing sewer main, pre- and post- construction CCTV inspection and final testing of the CIPP system. This item shall also include the "top hat" required by the specifications. All CIPP lateral reinstatements shall be paid under this item regardless of the size or length of reinstatement. No separate bid items of varying sizes or length of CIPP lateral reinstatement will be provided in the contract. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each CIPP lateral reinstatement complete and ready for use.

S CIPP LINER This bid Item is to pay for rehabilitation of existing sanitary sewers using the Cured-In-Place-Pipe method. This bid item description applies to all CIPP sizes included in the contract.

All CIPP Liner items of all varying sizes shall include all labor, materials, customer notification, testing, necessary permits, ingress and egress procedures, bypass pumping, pre- construction video, sediment and root removal, dewatering, traffic control, erosion and sediment control, excavation pits, removal and replacement of manhole frames and covers as necessary to facilitate the lining work, sealing at manholes and service connections, clearing and grubbing, pipeline cleaning, re-cleaning and video inspection as many times as necessary, debris collection and disposal, root removal, pre- and post-construction video inspection, all digital inspection footage, final report preparation and approval, the cost of potable water from the Owner, required compliance tests, site restoration, site cleanup, sealing of liner at manholes, acceptance testing and all other rehabilitation work and incidentals not included under other pay items necessary to complete the rehabilitation per the plans and specifications. There will be no separate payment for acceptance testing of the lined pipe; but shall be considered incidental to this item. Pay under this item shall be by each size bid in the contract. Pay measurement shall be from center of manhole to center of manhole. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S CIPP PROTRUDING LATERAL REMOVAL This item includes all equipment, materials, labor and incidentals necessary to enter the sewer in compliance with all safety/confined space requirements, remove a sufficient amount of the protruding tap to insure a proper and safe Cured-In-Place-Pipe lining insertion and perform pre-installation CCTV. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. Payment for this item shall be EACH (EA) for each protruding lateral removed.

S CONCRETE PIPE ANCHOR This item shall be constructed on the sewer pipe at the locations shown on the plans in accordance with sanitary sewer specifications and standard drawings. Payment for concrete anchors will be made at the contract unit price each in place complete and ready for use. Each concrete anchor of sewer pipe or force main shall be paid under one bid item per contract regardless of the sizes of carrier pipe being anchored in the contract. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S DIRECTIONAL BORE Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of force main or gravity sewer under streets, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S ENCASEMENT CONCRETE Includes all labor, equipment, excavation, concrete, reinforcing

steel, backfill, restoration, and etc., to construct the concrete encasement of the sewer or force main as shown on the plans, and in accordance with the specifications and standard drawings. Payment under this item shall be in addition to the carrier pipe as paid under separate bid items. Carrier pipe is not included in this bid item. Any and all concrete encasement shall be paid under one bid item included in the contract regardless of the size of the carrier pipe or the volume of concrete or steel reinforcement as specified in the plans and specifications. No separate bid items will be established for size variations. Measurement of pay quantity shall be from end of concrete to end of concrete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

S ENCASEMENT STEEL BORED This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to bore and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The sizes of encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.) Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S ENCASEMENT STEEL OPEN CUT This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to open cut install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The size encasement to be paid under the size ranges specified in the bid items shall be as follows:

- Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
- Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
- Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
- Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
- Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
- Range 6 = All encasement sizes greater than 24 inches

(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.) Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S FORCE MAIN This description shall apply to all PVC and ductile iron and polyethylene/plastic pipe bid items of every size and type, except those bid items defined as “Special”. This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall also include pipe anchors on polyethylene pipe runs as shown on the plans or required by the specifications to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S FORCE MAIN AIR RLS/VAC VLV This bid item description shall apply to all force main air release/vacuum valve installations of every size except those defined as “Special”. This item shall include the air release/vacuum valve, main to valve connecting line or piping, manhole/vault/structure, access casting or doors, tapping the main, labor, equipment, excavation, proper backfill and restoration required to install the air release/vacuum valve at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. All air release/vacuum valves on a project shall be paid under one bid item regardless of size. No separate pay items will be established for size variations. Only in the case of the uniqueness of a particular air release/vacuum valve would a separate bid item be established. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S FORCE MAIN DIRECTIONAL BORE Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of sewer or force main under streets, buildings, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company’s Specifications. If the Company does not have specifications, KYTC’s Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S FORCE MAIN POINT RELOCATE This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing force main at point locations such as to clear a conflict at a

proposed drainage structure, pipe or any other similar short relocation situation, and where the existing pipe material is to be reused. The contractor shall provide any additional pipe or fitting material needed to complete the work as shown on the plans and specifications. The materials provided shall be of the same type and specification as those that exist. Substitution of alternative materials shall be approved by the engineer in advance on a case by case basis. New polyethylene wrap is to be provided (if wrap exists or is specified in the specifications to be used). If it is necessary that the pipe be disassembled for relay, payment under this item shall also include replacement of joint gaskets as needed. Bedding and backfill shall be provided and performed the same as with any other pipe installation as detailed in the plans and specifications. Payment under this item shall be for each location requiring an existing main to be relocated horizontally or vertically regardless of pipe size or relocation length. No separate pay items will be established for pipe size variations or relocation segment length variations. Force Main Relocate shall not be paid on a linear feet basis; but shall be paid EACH (EA) at each location when complete and placed in service. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

S FORCE MAIN TAP SLEEVE/VALVE RANGE 1 OR 2 This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

- Range 1 = All live tapped main sizes up to and including 8 inches
- Range 2 = All live tapped main sizes greater than 8 inches

Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S FORCE MAIN TIE-IN This bid description shall be used for all force main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, testing and backfill required to make the force main tie-in as shown on the plans and in accordance with the specifications complete and ready for use. This bid item shall include purge and sanitary disposal of any sewage from any abandoned segments of force main. Pipe for tie-ins shall be paid under separate bid items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S FORCE MAIN VALVE This description shall apply to all force main valves of every size required in the plans and specifications, except those bid items defined as "Special". Payment under this description is to be for gate or butterfly force main valves being installed with new force main. This item includes the valve as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), valve box and valve stem extensions, backfill, concrete pad around valve box (if required by specification), restoration, testing, and etc., required to install the specified valve at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, force main valves shall be restrained. Force main valve restraint shall be considered incidental to the force main valve and adjoining pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be

referenced. This item shall be paid EACH (EA) when complete.

S FORCE MAIN VALVE BOX ADJUST Includes all labor, equipment, valve box and valve stem extensions (if required), excavation, backfill, concrete pad around valve box (when specified in specifications or plans), restoration, and etc., to adjust the top of the force main valve box to finished grade complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LATERAL CLEANOUT This item shall be for payment for installation of a cleanout in a service lateral line. This item shall include furnishing and installation of a tee, vertical pipe of whatever length required, and threaded cap. The cleanout shall extend from the lateral to final grade elevation. The size of the cleanout shall be equivalent to the size of the lateral. The cleanout materials shall meet the same specification as those for the lateral. The cleanout shall be installed at the locations shown on the plans or as directed by the engineer. Only one pay item shall be established for cleanout installation. No separate pay items shall be established for size or height variances. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LATERAL LONG SIDE This bid item description shall apply to all service lateral installations of every size up to and including 6 inch internal diameter, except those lateral bid items defined as "Special". This item includes the specified piping material, main tap, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service lateral installations where the ends of the lateral connection are on opposite sides of the public roadway. The new lateral must cross the centerline of the public roadway to qualify for payment as a long side lateral. The length of the service lateral is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service lateral across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LATERAL SHORT SIDE This bid item description shall apply to all service lateral installations of every size up to and including 6 inch, except those lateral bid items defined as "Special". This item includes the specified piping material, main tap tee, bends, clean outs, labor, equipment, excavation, backfill, testing, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for lateral installations where both ends of the lateral connection are on the same side of the public roadway, or when an existing lateral crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service lateral is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the lateral crosses a private residential or commercial entrance; but, not a public roadway. Private or commercial

entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S LINE MARKER This item is for payment for furnishing and installing a ground level sewer utility line marker as specified by the utility owner specifications and plans. A line marker may consist of a post or monument of whatever materials specified and shall include markings and/or signage on same as specified by plans or specifications. This item shall include all labor, equipment, and materials needed for complete installation of the marker. This item shall be paid EACH (EA) when complete.

S MANHOLE Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup in accordance with the specifications and standard drawings. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE ABANDON/REMOVE Payment under this item is for the partial removal and/or filling of any sanitary sewer manhole regardless of size or depth that no longer serves any purpose. Payment shall be made regardless of whether the manhole is or is not in conflict with other work. Any manhole requiring partial removal, but not total removal, in order to clear a conflict with other work shall be paid under this item. All manholes partially removed shall be removed to a point at least one foot below final grade, one foot below roadway subgrade, or one foot clear of any other underground infrastructure, whichever is lowest. If partial removal of an abandoned manhole is elected by the contractor, the remaining manhole structure shall be refilled with flowable fill. Payment for disposal of a sanitary sewer manhole will be made under this item only. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE ADJUST TO GRADE Payment under this item is for the adjustment of sanitary sewer casting elevation on all sizes of existing sanitary manholes. This work shall be performed in accordance with the sanitary sewer specifications. Payment shall be made under this bid item regardless of the amount of adjustment necessary to a sanitary sewer manhole casting or diameter of the manhole. Work under this pay item may be as simple as placing a bed of mortar under a casting; but, shall also be inclusive of installation of adjusting rings, and /or addition, removal, or replacement of barrel sections. The existing casting is to be reused unless a new casting is specified on the plans. New casting, when specified, shall be paid as a separate bid item. Anchoring of the casting shall be incidental to this item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA)

when complete.

S MANHOLE CASTING STANDARD Payment under this bid items is for furnishing of a new standard traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

S MANHOLE CASTING WATERTIGHT Payment under this bid item is for furnishing of a new watertight traffic baring casting for sanitary manholes meeting the requirements of the sanitary sewer specifications and standard drawings. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when installed.

S MANHOLE RECONSTRUCT INVERT This bid item is to pay for all labor, equipment, and material for rework of the manhole bench to redirect or eliminate flow, such as when the flow of a pipe or pipes are being removed or redirected. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in elimination or redirect of flow. This item shall also include providing and placement of a rubber seal or boot as required by utility specification, standard drawing or plan. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. No payment shall be made under this bid when MANHOLE TAP EXISTING, or MANHOLE TAP EXISTING ADD DROP are being paid at the same location, as this type of work is included in those items. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE TAP EXISTING This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each core opening added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and scope of work needed to comply with the specifications, standard drawings, and plans. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE TAP EXISTING ADD DROP This bid item is to pay for all labor, equipment, and material for coring one opening in an existing manhole base, addition of a rubber seal as specified, addition of a vertical drop pipe to the outside of the manhole, placement of reinforcing steel and concrete to encase vertical pipe, and rework of the manhole bench to direct the additional pipe flow. The bid item shall be paid for each drop added to a single manhole. This bid item shall also include any rework of the existing manhole bench due to the elimination of other existing pipes and flow. This work will be as specified in the plans, specifications, or directed by the engineer. This work may consist of, but is not limited to, removal of concrete and/or placement of concrete in the addition, elimination, or redirect of flow. The contractor shall draw his own conclusions as to the effort and

scope of work needed to comply with the specifications, standard drawings, and plans. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH DROP Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with drop. Payment for drop manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Drop manholes shall include concrete base, barrel sections, drop materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH LINING Payment under this item is for the installation of new 4 foot interior diameter sanitary sewer manhole with corrosion resistant lining. Payment for manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Manholes shall include concrete base, barrel sections, cone section or slab top, steps, lining, excavation, backfilling, air testing, restoration, and cleanup in accordance with the standard drawings. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S MANHOLE WITH TRAP Payment under this item is for the installation of a new manhole with trap. Payment for trap manholes will be made at the contract unit price each in place complete and ready for use at the locations shown on plans in accordance with specifications and standard drawings. Trap manholes shall include concrete base, manhole structure and trap materials, cone section or slab top, steps, excavation, backfilling, air testing, restoration, and cleanup. All materials, except casting, shall be new and unused. An existing casting from an existing abandoned or removed manhole is to be reused and shall be considered incidental to this item. When a new casting is specified, or an existing casting is unavailable, it shall be paid as a separate bid item. Anchoring of casting, new or used, shall be considered incidental to this bid item. No additional compensation will be paid for manhole height variations. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S PIPE This description shall apply to all PVC and ductile iron gravity sewer pipe bid items of every size and type 8 inches internal diameter and larger, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to,

tap tees and couplings for joining to existing similar or dissimilar pipes), polyethylene wrap (if required by specification), labor, equipment, excavation, bedding, restoration, pressure or vacuum testing, temporary testing materials, video inspection, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. This bid item shall include material and placement of flowable fill under existing and proposed pavement, and wherever specified on the plans or in the specifications. No additional payment will be made for rock excavation. Measurement of quantities under this item shall be through fittings and encasements to a point at the outside face of manhole barrels, or to the point of main termination at dead ends or lamp holes. Carrier pipe placed within an encasement shall be paid under this item and shall include casing spacers and end seals. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF).

S PIPE POINT REPAIR This item is to be used to pay for repair of short lengths of existing sanitary sewer pipe that, through prior video inspection or other means, are known to have pre-existing failure. Pipe Point Repair may be needed in preparation for installation of cured-in-place-pipe (CIPP) lining or other instances where failure is known and repair is prudent. The size of pipe shall not be defined in separate bid items. All diameter sizes of point repair shall be paid under this one item. The materials to be used to make the repair shall be as defined on the plans or in the specifications. This bid item shall include all excavation, pipe materials, joining materials to connect old and new pipe, bedding, and backfill to complete the repair at the locations shown on the plans or as directed by the engineer, complete and ready for use. This bid item shall include bypass pumping when required. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA).

S PUMP STATION This item is for payment for installation of sanitary pump stations including above or below ground structure for housing of the pumps. This item shall include all pumps, piping, fittings, valves, electrical components, building materials, concrete, any other appurtenances, labor, equipment, excavation, and backfill, to complete the pump station installation as required by the plans, standard drawings, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LUMP SUM (LS) for each when complete.

S STRUCTURE ABANDON This item is to be used to pay for abandonment of larger above or below ground sewer structures such as air release/vacuum valve vaults, pump stations, tanks, etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to sewer construction, (i.e., abandonment of standard air release/vacuum valves up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted fill or flowable fill for abandonment of the structure in place and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

S STRUCTURE REMOVAL This item is to be used to pay for removal of larger above or below ground sewer structures such as air release/vacuum valve vaults, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however, structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to sewer

construction, (i.e., removal of standard air release/vacuum valves and their structure up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted backfill for removal of the structure and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

TECHNICAL SPECIFICATIONS

AA HIGHWAY TO I-275 CONNECTOR SANITARY SEWER RELOCATION

SECTION 00003

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SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. General Description of Work
- B. Work by ENGINEER
- C. Sequence of Work
- D. CONTRACTOR's Use of Site
- E. Easements and Rights-of-Way
- F. Notices to Owners and Authorities of Property Adjacent to Work
- G. Salvage of Equipment and Materials

1.2 GENERAL DESCRIPTION OF WORK

- A. The Work to be performed under this Contract consists of providing all labor, equipment, materials, supplies, tools, and supervision necessary to complete installation of approximately 500 feet of 8" gravity sewer and 251 feet of 12" gravity sewer. Approximately 51 feet of steel encasement pipe will be bored and jacked under the existing Three Mile Road. Work also consists of installation of 6 sanitary sewer manholes of which 2 of the manholes are drop manholes. The work also consists of pipe removal, pipe abandonment, manhole removal, manhole abandonment, pipe anchoring, and bypass pumping as shown on the Drawings.
- B. The Work is located near Northern Kentucky University campus around the intersection of Three Mile Road and Tesseneer road within the ENGINEER'S service area in Campbell County, Kentucky.

1.3 REFERENCE TO ENGINEER

- A. Where the word "ENGINEER" appears in any utility owner specifications included in this proposal, utility owner specifications included to be a part of this contract by reference or on the utility relocation plans, it shall be understood the "Engineer" is the Kentucky Transportation Cabinet (KYTC) Section Engineer or designated representative and the utility owner engineer or designated representative jointly. Both engineers must mutually agree upon all decisions made with regard to the utility construction. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

1.4 WORK BY ENGINEER

- B. ENGINEER will perform certain activities in connection with the Work as follows:
1. Operation of all utility water and wastewater system valves.

1.5 SEQUENCE OF WORK

- A. The Work shall be constructed in accordance with the requirements as outlined in Section 01043, Coordination with ENGINEER'S Operations. All specified planning for tie-ins to existing facilities and other matters pertaining to coordinating the sequence of construction and maintaining operation of the facilities shall be submitted to the ENGINEER for approval.

1.6 CONTRACTOR'S USE OF SITE

- A. General:
1. The health, safety, and welfare of the ENGINEER's service area is dependent on the continuous and uninterrupted operation of the Wastewater Collection System. CONTRACTOR shall conduct the Work in such a fashion that no disruptions to operations occur and the required flow through the pump stations and force main and gravity sewers is maintained continuously throughout the construction period.
 2. CONTRACTOR's activities judged to be detrimental to the safe and proper handling of the sewage will be postponed or prohibited as deemed appropriate.
- B. CONTRACTOR shall:
1. Assume full responsibility for protection and safekeeping of products stored on and off premises.
 2. Move stored products that interfere with the operation of ENGINEER and/or property owners.
 3. Obtain and pay for all additional storage or work areas required for his operations.
 4. Not interfere with operation of ENGINEER and/or property owner.
 5. Provide all tools, ladders, equipment, etc. for CONTRACTOR's work and the work of all his subcontractors.
 6. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored

by the CONTRACTOR, at his sole expense, to a condition equal to that existing before the damage was done.

- C. Limits on CONTRACTOR'S use of site are:
1. CONTRACTOR and all personnel shall be restricted to the construction areas shown on the Drawings and designated by the ENGINEER.
 2. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy privately-owned land with men, tools, materials or equipment, except on easements provided herein.
 3. CONTRACTOR shall ensure that all utilities are in good working condition for use by the ENGINEER's personnel at all times unless written permission is received from the ENGINEER for temporary outages.
 4. CONTRACTOR shall be responsible for any damage resulting from construction activities.
 5. CONTRACTOR shall not block any access to private property.

1.7 EASEMENTS AND RIGHTS-OF-WAY

- A. Easements and rights-of-way are provided by ENGINEER as shown on the Drawings. Confine construction operations within the easements indicated on the Drawings or as directed by the ENGINEER. Use due care in placing construction tools, equipment, excavated materials and pipeline materials and supplies in order to avoid damage to property and interference with traffic. The CONTRACTOR shall provide land required for storage of his construction materials and/or any temporary construction facilities or where construction operation must move beyond easement boundaries provided by the ENGINEER. The CONTRACTOR shall submit copies of all separate agreements with property owners to the ENGINEER. CONTRACTOR shall restore all lands required outside the easement boundaries provided by the ENGINEER, at his sole expense, to a condition equal to that existing before the Work was started.
- B. Within Highways: Permits will be obtained by ENGINEER. All Work performed and all operations of CONTRACTOR, its employees, or Subcontractors within the limits of highway rights-of-way shall conform to the requirements and be under the control of the railroad or highway authority owning, or having jurisdiction over and control of, the right-of-way.

1.8 NOTICES TO ENGINEER AND AUTHORITIES OF PROPERTIES ADJACENT TO THE WORK

- A. Notify owners of adjacent property and utilities when prosecution of the Work may affect them.
- B. When it is necessary to temporarily obstruct access to property, or when any utility service connection must be interrupted, give notices sufficiently in advance to enable the affected persons to provide for their needs. Conform notices to any applicable local ordinances and, whether delivered orally or in writing, include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.
- C. Utilities and other concerned agencies shall be notified at least 48 hours prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.

1.9 SALVAGE OF EQUIPMENT AND MATERIALS

- A. Existing equipment and materials removed, and not shown or specified to be reused as part of the Work, shall become CONTRACTOR'S property.
- B. Existing equipment and materials removed by CONTRACTOR shall not be reused in the Work except where so specified or indicated.
- C. CONTRACTOR shall carefully remove, in a manner to prevent damage, all equipment and materials specified or indicated to be salvaged and reused or to remain the property of ENGINEER. Store and protect salvaged items specified or indicated to be reused in the Work. Replace in kind or with new items any items damaged in removal, storage, or handling through carelessness or improper procedures.
- D. CONTRACTOR may furnish and install new items instead of those specified or indicated to be salvaged and reused, in which case such removed items will become CONTRACTOR's property.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++END OF SECTION++

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 GENERAL

- A. The total bid price for each part of the project shall cover all work required by the Contract Documents.
- B. All costs in connection with the proper and successful completion of the work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction facilities, temporary wastewater flow control, equipment, and tools; and providing all necessary labor and supervision to fully complete the work shall be included in the unit and lump sum prices bid.

1.2 FINAL PAYMENTS

- A. Final payments to the Contractor shall be made on the basis of actual quantities of work completed, as determined by field measurements, in accordance with the KYTC Standard Sanitary Sewer Water Bid Items and Descriptions. (Attached to the End of this Specification for convenience)

1.3 MEASUREMENTS

- A. Measurements shall be made as necessary to allow quantification of said Work at the close of each day's construction. Measurements shall be made by the CONTRACTOR.
- B. The quantities to be paid for and their respective locations shall be recorded and agreed upon at the close of each day's construction by Resident Project Representative and the CONTRACTOR's personnel in charge. A quantity log will be maintained daily by the CONTRACTOR and agreed upon by the Resident Project Representative.
- C. A copy of same which also signifies said agreement shall be furnished to the Resident Project Representative daily by the CONTRACTOR.
- D. If requested by ENGINEER, The CONTRACTOR shall furnish a weekly statement of the agreed-upon quantities and their respective locations.

1.4 SUMMARY

- A. It is intended that payments noted above shall constitute full compensation for all work shown and required by the Sanitary Sewer drawings and specifications for this Contract.
- B. The cost of other auxiliary operations and/or materials required to make a completed project shall be absorbed in the appropriate lump sum or unit price items for which bids are requested.

1.5 CUT SHEETS

- A. The CONTRACTOR will be furnished copies of the ENGINEER's quantity logs which shall be the basis of payment for all work.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++END OF SECTION++

SECTION 01043

COORDINATION WITH ENGINEER'S OPERATIONS (BYPASS PUMPING)

PART 1 – GENERAL

1.1 GENERAL

- A. ENGINEER has primary responsibility and authority over the control and operation of all wastewater collection and conveyance facilities.
- B. No Work shall be undertaken which would jeopardize the minimum required operations of the ENGINEER's facilities.
- C. Perform all Work necessary to complete connections and tie-ins to existing facilities.
- D. Allow full access for ENGINEER's personnel to all facilities not undergoing modifications and improvements. Access, on an as-needed basis, shall be provided to all facilities.
- E. ENGINEER shall have the authority to stop or prohibit Work that would interfere or jeopardize the continuous and reliable operation of the facilities.
- F. Disturbances to Operations:
 - 1. Keep existing, temporary, and new facilities in operation continuously during the construction period unless otherwise specifically permitted in these Specifications or approved by the ENGINEER.
 - 2. It is required that the existing, temporary, and new facilities (as they come on line) continue to operate. Scheduled interruptions of any facility's operations shall be coordinated with the ENGINEER's personnel at all times. Frequency and duration of disturbance to these operations shall be minimized.
 - 3. Unscheduled interruptions resulting from construction work under the CONTRACTOR's responsibility shall be returned at once to normalcy through temporary or permanent means. Temporary corrections shall be made permanent at the next scheduled interruption to operations if practicable, or as soon as practicable. All permanent corrections shall meet applicable requirements in this document.
 - 4. In no case, other than specifically permitted in these Specifications or approved by the ENGINEER, shall interruptions of the existing operations occur. Where such restriction is impracticable as determined by the ENGINEER, the CONTRACTOR shall provide

temporary or permanent means and sustain all interrupted systems at full operations. All permanent means shall meet applicable requirements in this document. The CONTRACTOR shall schedule all necessary interruptions of existing operations with the ENGINEER.

5. Equipment and materials to be used for temporary purposes need not be new, but shall be in serviceable condition and installed in a safe manner.
6. Temporary facilities shall be installed so as to minimize interference with construction and to meet OSHA, NEC and any other applicable laws', codes' or regulations' requirements.
7. Relocation of such temporary facilities may be required as construction progresses, the cost of which shall be included herein.
8. Paragraph 1.3 specifies the minimum requirements for temporary pumping facilities. Additional components and systems may be required in order to ensure continuous pumping operations through the construction period, the cost of which shall be included herein.
9. CONTRACTOR shall be liable for all costs or fines resulting from unscheduled interruption of the operation of the ENGINEER's facilities.

1.2 SEQUENCING AND OPERATIONS

A. General:

1. The CONTRACTOR shall propose a Construction Schedule indicate his proposed construction sequencing for the project's major Work, facilities and/or systems. CONTRACTOR shall be fully responsible for scheduling and coordination of the Work, including all construction activities which require action by ENGINEER's personnel. Scheduling of these activities shall accommodate holidays observed by the ENGINEER and normal working hours as defined in the Supplementary Conditions.
2. CONTRACTOR shall submit the Construction Schedule to the ENGINEER for review and approval. CONTRACTOR shall not begin work until the proposed construction sequencing is reviewed and approved by the ENGINEER.
3. Approval by the ENGINEER does not waive the CONTRACTOR's requirements for successful completion of the Work nor transfer responsibility for successful execution of the Work to the ENGINEER.
4. All operations of existing valves and other items of existing equipment required for the Work shall be done by the ENGINEER's personnel.

5. Insofar as possible, all equipment shall be tested and in operating condition before the final tie-ins are made connecting the new equipment to the existing facility.
6. The CONTRACTOR shall carefully coordinate all Work and schedules and shall submit a written request to the ENGINEER 48 hours before shutdowns or tie-ins are required.
7. Each request shall be in the form of a "Cut-in-Schedule" that shall include the estimated duration, the starting time, and include the method of Work. Each request must be approved and signed by the ENGINEER prior to the start of Work.
8. Sewer overflows due to Contractor's operations are strictly prohibited. All overflows that occur shall be cleaned up properly by the Contractor to Owner's satisfaction. All costs and fines incurred by Owner due to a sewer overflow caused by or related to Contractor's work, shall be paid by the Contractor
9. Contractor shall submit a detailed Sewer Overflow Response Plan (SORP) to the Owner for a review and approval prior to starting work. The SORP shall include at a minimum: The plan to respond to, contain, stop and clean up an overflow. Emergency and after-hour contacts shall be provided, including names of personnel to be used for vacuuming and cleanup.

1.3 TEMPORARY BYPASS PUMPING

A. General:

1. When wastewater flows at the upstream manhole of the sewer section being repaired or installed do not allow the proper sewer repair or manhole installation the flows shall be reduced to the levels required by one of the following methods: plugging/blocking of the flows, or pumping/bypassing of the flows as approved by the Owner.
2. In some application, the wastewater flow may be plugged and contained within the capacity of the collection system. This shall only be done when it has been determined, by the ENGINEER, that the system can accommodate the surcharging without any adverse impact.
3. CONTRACTOR shall furnish, install, maintain, and operate temporary bypass pumping facilities as required to complete the Work.
4. CONTRACTOR shall design the temporary bypass pumping facilities to convey peak dry weather and wet weather flows from the upstream manholes where existing manhole or sewer tie-ins, replacement, or modifications will be conducted in a manner that will prevent backup of the existing system. ENGINEER will provide required pumping rates for the specific project.
5. All tie-ins, replacement, or modifications shall be performed during low flow conditions.

6. To the extent possible, all tie-ins, replacement, or modifications Work shall be accomplished in no more than one 8-hour period. If Work required extends beyond 8-hours or weather causes higher flows in the existing system during the Work, the new Work shall be stopped and the existing system shall be placed back into service. The new Work shall be properly protected from damage. Any damage to the new Work or damage to surrounding areas caused by the new Work shall be repaired or replaced at the ENGINEER's decision by the CONTRACTOR at the CONTRACTOR's sole expense.
7. CONTRACTOR shall provide all power, fuel, maintenance materials, parts, and other expendables in order to maintain temporary pumping through the duration of the Work.
8. CONTRACTOR shall provide one standby pump equal in capacity to the largest pump on site.
9. CONTRACTOR shall provide standby power or 48-hour on-site fuel storage capacity for diesel engine type pumps to ensure continuous operation at all times.
10. CONTRACTOR shall provide sound attenuation for temporary pumping facilities to limit noise levels to no more than 70dBA at a distance of 30 feet from the noise source.
11. CONTRACTOR shall perform an operation demonstration of the temporary pumping system prior to beginning the new Work. The purpose of the operation demonstration is to verify to ENGINEER that the temporary pumping system is capable of continuous operation through the duration of the Work without backup of the sewer system
12. Temporary pumping system shall remain fully operational until all modifications are complete and approved by ENGINEER.
13. Following successful completion of the new Work, CONTRACTOR shall remove all temporary pumps, piping and appurtenances and restore area to proper operation and to the ENGINEER's satisfaction
14. The minimum pumping capacity of the bypass pumps must match or be greater than number presented in the table below for the new pipe diameters being installed.

Sewer Line	New Pipe Diameter	Pump Capacity
A	8"	355 gpm
B	12"	985 gpm
C	8"	355 gpm

15. CONTRACTOR shall use the sewer easement for routing the discharge piping. The routing must prevent the wastewater discharge

and spills. The CONTRACTOR shall inspect each section of newly laid sewer before removal of the bypass pumping system.

16. The CONTRACTOR shall protect all pumps, piping, and hoses that carry raw wastewater from damage due to traffic.

1.4 PLUGGING AND BLOCKING

A. General:

1. The CONTRACTOR shall insert a sewer line plug into the line at a manhole upstream from the section being inspected or repaired. The plug shall be so designed that all or any portion of the blocked flow can be released.
2. Wastewater flow may be completely plugged and contained within the capacity of the existing upstream collection system if the system is deemed by ENGINEER of being capable of accommodating the surcharge without adverse impact.

1.5 SUBMITTALS

- ##### A. Submit detailed schedule of proposed connections, including shutdowns, tie-ins, replacement or modification with the Construction Schedule. Refer to sections 01043. Submittal shall include the following unless otherwise directed by the ENGINEER:
1. Proposed time and date as well as the anticipated duration. Submit specific time and date information to ENGINEER, if changed, 72 hours in advance of proposed Work.
 2. Bypass Pumping Plan and method used to make tie-ins, replacement or modifications to existing sewers or manholes. The Bypass Pumping Plan shall include the following:
 - a. Information on the pumps to be used and how their size was selected, pump capacity, standby power, noise reduction devices, valves, piping and appurtenances to be used.
 - b. Site plan indicating location of temporary pumping system, including pumps, fuel storage tanks, noise reduction devices, valves, and discharge piping shall also be provided.

1.6 Sewer Overflow Response Plan

See Sections above.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++END OF SECTION++

SECTION 01340

SHOP DRAWING PROCEDURES

1.1 GENERAL

- A. Shop Drawing procedures shall conform to requirements of General Conditions and as described in this Section unless otherwise directed by the ENGINEER.
- B. Shop drawings shall be submitted for each type of equipment, piping, construction operation, facility or system specified on the drawings or in the specifications.
- C. A schedule of values, site specific safety plan, submittal schedule, construction schedule, construction photos, testing results, record documents and other items requested by the ENGINEER during the course of the project shall also be submitted

1.2 PROCEDURE

- A. Submit Shop Drawings to: ENGINEER. Submit additional copy to the Resident Project Representative at address provided by ENGINEER.
- B. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section.
- C. At the beginning of each letter of transmittal provide a reference heading indicating the following:
 - 1. ENGINEER'S Name _____
 - 2. Project Name _____
 - 3. Contract Name/No. _____
 - 4. Transmittal No. _____
 - 5. Section No. _____
- D. If a Shop Drawing deviates from the requirements of the Contract Documents, CONTRACTOR shall specifically note each variation in his letter of transmittal.
- E. All Shop Drawings submitted for approval shall have a title block with complete identifying information satisfactory to ENGINEER.
- F. All Shop Drawings submitted shall bear the stamp of approval and signature of CONTRACTOR as evidence that they have been reviewed by CONTRACTOR. Submittals without this stamp of approval will not be reviewed by ENGINEER and will be returned to CONTRACTOR.

CONTRACTOR’S stamp shall contain the following minimum information:

Project Name:_____

CONTRACTOR’S NAME:_____

Date:_____

Item:_____

Specifications:

Section:_____

Page No.:_____

Para. No.:_____

Drawing No.:_____ of _____

Location:_____

Submittal No.:_____ Review Cycle No.:_____

Shop Drawing/Document Reference No.:_____

Company Name of Source:_____

Approved By:_____

G. Shop Drawing Submittal Numbering and Identification:

1. In order to identify and track all Shop Drawing submittals as separate and unique items, the CONTRACTOR shall utilize a two number Shop Drawing submittal identification numbering system as follows:
- a. The first number shall be the Submittal Number. The Submittal Number shall be a separate and unique Shop Drawing. No two Shop Drawings shall be submitted with or under the same Submittal Number, regardless of whether or not they are submitted together, at the same time, under the same Section Number and/or with the same transmittal letter. A Submittal Number shall be assigned to each unique and separate submittal that needs to be tracked as a separate and unique item. The Submittal Number shall be a two part, eight character,

number assigned by CONTRACTOR in the following manner:

- 1) The first part of the Submittal Number shall consist of five characters that pertain to the applicable Section Number. For example:

<u>Section Number</u>	<u>Submittal Number, First Part</u>
2220	02220
11336	11336
13620	13620

- 2) The second part of the Submittal Number shall consist of three digits (the numbers 001 to 999) to number each separate and unique item, document, or drawing submitted under each Section Number.
 - 3) A dash shall separate the two parts of the Submittal Number.
 - 4) A typical Submittal Number would be as follows:
11336-003;
11336 = Section for Secondary Clarifier Collector Mechanism;
and
003 = the third submittal under this section.
- b. The second number shall be the Review Cycle. The Review Cycle shall be a three-digit number indicating the initial submission or resubmission or resubmission of the same Shop Drawing submittal. For example:
- 001 = Initial submission.
 - 002 = First resubmission.
 - 003 = Second resubmission, etc.

- c. Some examples of typical Shop Drawing submittal identification numbers are:

<u>Submittal Number</u>	<u>Review Cycle</u>
11336-003	001

11336 = Section for Secondary Clarifier Collector Mechanism;
003 = the third submittal under this section; and,
001 = the initial submission of this submittal.

<u>Submittal Number</u>	<u>Review Cycle</u>
08331-001	001

08331 = Section for Overhead Coiling Doors;
001 = the first submittal under this section; and,
001 = initial submission for this submittal.

<u>Submittal Number</u>	<u>Review Cycle</u>
08331-001	002

08331 = Section for Overhead Coiling Doors;
001 = the first submittal under this section; and,
002 – first resubmission of this submittal.

- H. CONTRACTOR shall initially submit to ENGINEER a minimum of 7 copies of all submittals. The Resident Project Representative shall receive one copy only of each submittals which will be stamped “Preliminary – Not For Construction.”
- I. After ENGINEER completes his review, Shop Drawings will be marked with one of the following notations:
1. Approved.
 2. Approved as Corrected.
 3. Revise and Resubmit.
 4. Not approved.
- J. If a submittal is acceptable, it will be marked “Approved” or “Approved as Corrected”. Four prints or copies of the submittal will be returned to CONTRACTOR.
- K. Upon return of a submittal marked “Approved” or “Approved as Corrected”, CONTRACTOR may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.
- L. If a Shop Drawing marked “Approved as Corrected” has extensive corrections or corrections affecting other drawings or Work, ENGINEER may require that CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for record purposes. Such drawings will have the notation, “Approved as Corrected – Resubmit.”
- M. If a submittal is unacceptable, 2 copies will be returned to CONTRACTOR with one of the following notations:
1. “Revise and Resubmit.”
 2. “Not Approved.”
- N. Upon return of a submittal marked “Revise and Resubmit”, CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure. The “Not Approved” notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, CONTRACTOR shall repeat the initial approval procedure utilizing acceptable material or equipment.

- O. Any related Work performed or equipment installed without an “Approved” or “Approved as Corrected” Shop Drawing will be at the sole responsibility of the CONTRACTOR.
- P. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after data covering such is approved. CONTRACTOR shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.
- Q. ENGINEER will review and process all submittals promptly, but a first submission review period, not including mailing time, of 21 days shall be allotted by the CONTRACTOR when scheduling the Work. Shop Drawings being revised and resubmitted for review shall also have the same time allotted for ENGINEER’s review.
- R. It is CONTRACTOR’S responsibility to review submittals made by his suppliers and Subcontractors before transmitting them to ENGINEER to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for ENGINEER to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.
- S. CONTRACTOR shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within three submittals. All costs to ENGINEER involved with subsequent submittals of Shop Drawings, Samples or other items requiring approval, will be backcharged to CONTRACTOR, at the rate of 3.0 times direct technical labor cost by deducting such costs from payments due CONTRACTOR for Work completed. In the event that CONTRACTOR requests a substitution for a previously approved item, all of ENGINEER’S costs in the reviewing and approval of the substitution will be backcharged to CONTRACTOR unless the need for such substitution is beyond the control of CONTRACTOR.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECTION (Not Used)

++ END OF SECTION ++

SECTION 01541

PROTECTION OF THE WORK AND PROPERTY

1.1 GENERAL

- A. CONTRACTOR shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.
- B. In order to prevent damage, injury or loss, CONTRACTOR'S actions shall include, but not be limited to, the following:
 - 1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
 - 2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
 - 3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
 - 4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
 - 5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.
- C. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy privately-owned land with men, tools, materials or equipment, except on easements provided herein.
- D. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored by the CONTRACTOR, at his expense, to a condition equal to that existing before the damage was done.

1.2 BARRICADES AND WARNING SIGNALS

- A. Where Work is performed on or adjacent to any roadway, right-of-way, or public place, CONTRACTOR shall provide barricades, fences, lights, warning signs, danger signals, watchmen, and shall take other precautionary measures for the protection of persons or property and of the Work. Barricades shall be painted to be visible at night. From sunset

to sunrise, CONTRACTOR shall furnish and maintain at least one light at each barricade. Sufficient barricades shall be erected to keep vehicles from being driven on or into Work under construction. CONTRACTOR shall furnish watchmen in sufficient numbers to protect the Work.

CONTRACTOR'S responsibility for the maintenance of barricades, signs, lights, and for providing watchmen shall continue until the Project is accepted by ENGINEER.

1.3 TREE AND PLANT PROTECTION

- A. CONTRACTOR shall protect existing trees, shrubs and plants on or adjacent to the site that are shown or designated to remain in place by the ENGINEER against unnecessary cutting, breaking or skinning of trunk, branches, bark or roots.
- B. Materials or equipment shall not be stored or parked within the drip line.
- C. Temporary fences or barricades shall be installed to protect trees and plants in areas subject to traffic.
- D. Fires shall not be permitted under or adjacent to trees and plants.
- E. Within the limits of the Work, water trees and plants that are to remain, in order to maintain their health during construction operations.
- F. Cover all exposed roots with burlap that shall be kept continuously wet. Cover all exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, run-off or noxious materials in solution.
- G. If branches or trunks are damaged, prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by the ENGINEER.
- H. All damaged trees and plants that die or suffer permanent injury shall be removed when ordered by the ENGINEER and replaced by a specimen of equal or better quality.

1.4 PROTECTION OF EXISTING STRUCTURES

A. Underground Structures:

1. Underground structures are defined to include, but not be limited to, all sewer, water, gas, and other piping, and manholes, chambers, electrical conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.
2. All underground structures known to ENGINEER except water, sewer, electric, and telephone service connections are shown. This information is shown for the assistance of CONTRACTOR in accordance with the best information available, but is not guaranteed to be correct or complete.
3. CONTRACTOR shall explore ahead of his trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services, which such structures provide. If CONTRACTOR damages an underground structure, he shall restore it to original condition at his expense.
4. Necessary changes in the location of the Work may be made by ENGINEER, to avoid unanticipated underground structures.
5. See additional requirements on the Drawings.

B. Surface structures:

1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

C. Protection of Underground and Surface Structures:

1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, CONTRACTOR shall satisfy the ENGINEER that the methods and procedures to be used have been approved by the party owning same.
2. CONTRACTOR shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits of the Work. CONTRACTOR shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. CONTRACTOR shall repair

immediately all damage caused by his work, to the satisfaction of the owner of the damaged structure.

- D. All other existing surface facilities, including but no limited to, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at CONTRACTOR'S expense.

1.5 PROTECTION OF INSTALLED PRODUCTS AND LANDSCAPING

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.
- B. Control traffic to prevent damage to equipment, materials and surfaces.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECTION (Not Used)

++END OF SECTION++

SECTION 01560

ENVIRONMENTAL CONTROLS

1.1 GENERAL

- A. Provide and maintain, equipment, and temporary construction, as necessary to provide controls over environmental and safety conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.
- B. Prohibited Construction Activities:
 - 1. Disposing of excess or unsuitable excavated material in wetlands or floodplains, even with the permission of the property owner.
 - 2. Locating stockpile storage areas in environmentally sensitive areas.
 - 3. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, any wetlands, any surface waters, or outside the construction limits.
 - 4. Pumping of sediment-laden water from trenches or other excavations directly into any surface waters, any stream corridors, any wetlands, or storm sewers; all such water will be properly filtered or settled to remove silt prior to release.
 - 5. Discharging pollutants such as chemicals, fuels, lubricants, bituminous materials, raw sewage and other harmful waste into or alongside of rivers, streams, impoundments, or into natural or manmade channels leading thereto.
 - 6. Permanent or unspecified alteration of the flow line of any stream.
 - 7. Damaging vegetation outside of the construction area.
 - 8. Disposal of trees, brush, and other debris in any stream corridors, any wetlands, any surface waters, or at unspecified locations.
 - 9. Open burning of project debris without a permit.
 - 10. Discharging injurious silica dust concentrations into the atmosphere resulting from breaking, cutting, chipping, drilling, buffing, grinding, polishing, shaping or surfacing closer than 200 feet to places of residences or commercial, professional, quasi-public or public places of human occupation.
 - 11. Storing construction equipment and vehicles and/or stockpiling construction materials on property, public or private, not previously specified on the plans by the ENGINEER for such purposes.
 - 12. Running well point or pump discharge lines through private property or public property and rights-of-way without the written permission of the property owner and the consent of the ENGINEER.
 - 13. Non-compliance with the CONTRACTOR's, OSHA's, or the ENGINEER's safety requirements.

14. Operations entailing the use of vibratory hammers or compactors outside the hours of 8:00 a.m. and 5:00 p.m. or outside the hours allowed for construction by local ordinances or regulations.

1.2 SAFETY ADVISORY

- A. Scope: Sewer Installation
 1. Maintaining jobsite safety
 2. Maintaining traffic safety
- B. District funded jobs have a contractual and legal obligation for performance and breach of contract in regard to the safety of all exposed personnel. Reference the Occupational Safety Health Administration (OSHA) Multi Employer Citation Policy: Multi-employer Worksites, The Creating Employer, The Exposing Employer, The Correcting Employer, The Controlling Employer, Multiple Roles.
- C. The CONTRACTOR shall at all times conduct the work safely in order to assure a safe work site. The CONTRACTOR shall be responsible for the safety of the CONTRACTOR'S employees, agents and subcontractors, ENGINEER'S personnel and all other personnel or persons at the work site. The CONTRACTOR shall be responsible for the adequacy and safety of all construction methods or procedures and the safe prosecution of the work.
- D. The CONTRACTOR shall be responsible at all times to conduct the work and keep the work site in compliance with federal, state, and local safety Laws and Regulations, including but not limited to Occupational Safety and Health (OSHA) requirements. This includes shaft drilling operations, concrete moving and placement, confined space entry requirements for trench construction, including use of a trench box or other shoring to support trench walls and proper means of exit from an excavation.
- E. The CONTRACTOR shall, prior to actual construction, submit a Site Safety Manual tailored to the project along with the name or names of an authorized person who is a competent person as defined by OSHA (CFR, Title 29 – Labor, Part 1926 – OSHA) responsible for site safety activities. A resume of the qualifications of the competent person must be submitted to the ENGINEER. This resume shall include such items as: experience, education, special safety and first aid courses completed, safety conferences attended, familiarity with standards and regulations and certifications or registration.
- F. The CONTRACTOR shall have an authorized and competent safety representative as defined above on the work site at frequent and regular

intervals, or more often, as conditions require. Failure to have such a person at the site as specified herein constitutes an unsafe practice.

- G. The CONTRACTOR shall be responsible to suspend Work whenever a Work method or procedure or condition at work site is unsafe.
- H. The CONTRACTOR shall submit a written notification to the ENGINEER of any accident or injury. Such notification shall include the CONTRACTOR'S investigation and what measures are appropriate to avoid such accidents. Payment applications will not be authorized until such notice is provided.
- I. Failure of the CONTRACTOR to comply with any provision of this Specification section or the ENGINEER'S safety requirements or any federal, state or local safety Laws and Regulations constitute just cause for the ENGINEER to order suspension of Work.
- J. The CONTRACTOR will conduct Site Safety Audits on a periodic basis to be determined by the ENGINEER. The audit shall be performed using the Audit Checklist to be provided by the ENGINEER. The CONTRACTOR'S safety representative will perform the audit with the ENGINEER'S authorized representative in attendance. A copy of the completed audit checklist shall be furnished to the ENGINEER.
- K. None of the provisions of the section are intended to, nor shall be construed to, create any duty or responsibility on the ENGINEER to provide or enforce safety requirements of the CONTRACTOR. The duty, responsibility, and liability for safety shall remain with the CONTRACTOR.

1.3 JOB-SPECIFIC PRECAUTIONS

- A. The CONTRACTOR is advised to consider the job-specific elements of the Work when preparing and executing the safety plan.
- B. The CONTRACTOR shall make its own site investigation and evaluation for job- or site-specific safety concerns in addition to those listed herein.
- C. The following should be considered in preparation of the safety plan specific to the Work governed by this contract. The list does not limit, evaluate, or influence the means and methods of construction.
- D. Job-specific precautions include:

1. Personal protection equipment
2. Control of hazardous energy Lock-Out, Tag-Out (LOTO) procedures
3. Fall prevention and fall protection
4. Worker compensation requirements
5. Housekeeping, Slips Trips and Falls
6. Working within trenches and within excavation support
7. Hazardous communication program employee right to know
8. Maintaining safety in Work Zone.
9. Protection of pedestrians (barricades, signs, sidewalk closures, and temporary walkways).
10. Traffic control and Flagger safety.
11. Construction parking and access.
12. Storage of equipment and materials.
13. Dust control.
14. Movement of equipment and materials.
15. Moving and lifting of materials.
16. Confined space entry (manholes, trenches, sewer connections).
17. Emergency notification & First Aid.
18. Electrical (temporary power and extension cords). Ground fault protection and assured grounding program
19. Sanitation.
20. Fire Protection.
21. Temporary pumping for dewatering.
22. Fire Explosive Prevention Program using Hot Work Permits (obtain before use of sparking or open flame equipment).

- E. The above list is not intended to be an all-inclusive list and the CONTRACTOR is responsible for safety in all areas, whether listed above or not.
- F. CONTRACTOR shall submit to the ENGINEER, prior to the Pre-Construction meeting, a Site Safety Plan tailored to the project.
- G. In addition, any safety information or documentation required under the law to be filed with any state or federal agency, shall also be supplied to the ENGINEER. A copy of the Site Safety Plan shall at all times be present at the Work Site.
- H. The ENGINEER, prior to the start of work on the project, shall review the Site Safety Plan. Such review shall not constitute approval, but is merely to assure general compliance with the intent of the Specifications.

1.4 AIR POLLUTION AND NOISE CONTROL

- A. CONTRACTOR'S vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the work of the ENGINEER or others.
 - 1. Construction activities will be limited to daytime hours.
 - 2. Construction equipment will be provided with intake silencers and mufflers, as required by safety standards.
 - 3. All construction vehicles should be equipped with proper emissions control equipment.
 - 4. Periodically check equipment and machinery for proper tuning to minimize exhaust emissions and noise.

1.5 DUST CONTROL

- A. CONTRACTOR shall be responsible for controlling objectionable dust caused by his operation of vehicles and equipment, clearing or for any reason whatever. CONTRACTOR shall apply water and calcium chloride or use other methods subject to the ENGINEER'S approval which will keep dust in the air to a minimum. Dust control measures shall be implemented multiple times throughout each working day if necessary.

1.6 PEST AND RODENT CONTROL

- A. Provide rodent and pest control as necessary to prevent infestation of construction or storage area.
 - 1. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.

1.7 WATER CONTROL

- A. Provide methods to control surface water and water from excavations and structures to prevent damage to the Work, the site, or adjoining properties.
 - 1. Control fill, grading and ditching to direct water away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff courses so as to prevent any erosion, damage or nuisance.
- B. Provide, operate and maintain equipment and facilities of adequate size to control surface water.
- C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

1.8 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- B. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.
 - 1. Excavate and dispose of any contaminated earth offsite, and replace with suitable compacted fill and topsoil.
- C. Take special measures to prevent harmful substances from entering public waters.
 - 1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants.
 - 1. Prevent toxic concentrations of chemicals.
 - 2. Prevent harmful dispersal of pollutants into the atmosphere.
- E. All CONTRACTOR'S equipment used during construction shall conform to all current federal, state and local laws and regulations.

1.9 SEDIMENT & EROSION CONTROL

- A. This section covers erosion and sediment control during construction and shall include installing and maintaining sediment controls in locations on the project site specified by the ENGINEER, and as necessary to prevent the transport of sediments and sediment laden water outside the limits of the work area. These items shall include, but not be limited to silt fence, diversion berms and swales, inlet protection, check dams, silt basins, silt traps, stabilized construction entrances, and vegetative cover.
- B. The CONTRACTOR shall follow the procedures outlined herein to prevent substances from entering all natural drainage course waters as promulgated by the NPDES Stormwater Permit requirements. CONTRACTOR's efforts to control pollution and sediment and erosion control to public waters shall comply with requirements by the following documents:
 - 1. Northern Kentucky Sanitation District No.1 Storm water Rules & Regulations.
 - 2. U.S. EPA – Storm Water Management for Construction Activities 1992.
 - 3. Soil Conservation Service – Water Management and Sediment Control for Urbanizing Areas (March 1987)

- C. Plan and execute construction and earth work by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
 - 1. Hold the areas of bare soil exposed at one time to a minimum. Seed and straw all areas that will not be worked for thirty days within seven days of stopping Work in that area.
 - 2. Provide temporary control measures such as berms, dikes and drains.
- D. Construct fills and waste areas using selective placement to eliminate surface silts or delays in filling that will allow for erosion to occur.
- E. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion and continuously maintain the controls for the entire length of the project. Erosion and sediment controls shall be removed at the completion of construction, as required by the ENGINEER.
- F. CONTRACTOR shall properly install silt fence, check dams, diversion berms, silt basins, sediment capturing bags or other sediment and erosion controls along the length of the project in areas designated by the ENGINEER during construction to prevent sediment leaving the site and contain runoff within the work area.
- G. Submittals: The CONTRACTOR shall submit for approval, product data for silt fence, other sediment and erosion controls, work schedule, sequence of operations, and coordination with other work in accordance with the requirements of section 01340.
- H. Maintenance: The CONTRACTOR shall maintain new and existing erosion and sediment controls to contain sediment and sediment laden water within the Work area. Deficiencies identified during visual inspection by the ENGINEER, or other governing regulatory authority shall be remedied by the CONTRACTOR immediately at no additional cost to the ENGINEER.
- I. Removal and Disposal: The CONTRACTOR shall remove and dispose of erosion and sediment control measures after completion of construction, as directed by the ENGINEER.

- J. All sediment and sediment laden water shall be contained within the work area during construction and shall not be discharged directly to any adjacent watercourse. If sediment and erosion controls are not installed and maintained by the CONTRACTOR to the ENGINEER's satisfaction, the ENGINEER may not approve the CONTRACTOR's pay requests or the ENGINEER may stop Work until controls are properly installed.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECTION (Not Used)

++END OF SECTION++

SECTION 01630

SUBSTITUTIONS

1.1 GENERAL

- A. Requests for review of a substitution shall contain complete data substantiating compliance of proposed substitution with Contract Documents.

1.2 CONTRACTOR'S OPTIONS

- A. For materials or equipment (hereinafter products) specified only by reference standard, select product meeting that standard, by any manufacturer, fabricator, supplier or distributor (hereinafter manufacturer). To the maximum extent possible, provide products of the same generic kind from a single source.
- B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with Specifications.
- C. For products specified by naming one or more products or manufacturers and stating "or equal", submit a request for a substitution for any product or manufacturer which is not specifically named.
- D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is permitted, there is not option and no substitution will be allowed.
- E. Where more than one choice is available as a CONTRACTOR'S option, select product which is compatible with other products already selected or specified.

1.3 SUBSTITUTIONS

- A. During a period of 60 days after date of commencement of Contract Time, ENGINEER will consider written requests from CONTRACTOR for substitution of products or manufacturers, and construction methods (if specified).
 - 1. After end of specified period, requests will be considered only in case of unavailability of product or other conditions beyond control of CONTRACTOR.
- B. Submit 5 copies of request for substitution. Submit separate request for each substitution. In addition to requirements, include in request the following:
 - 1. For products or manufacturers:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature with product description, performance and test data, and reference standards.
 - c. Samples, if appropriate.

- d. Name and address of similar projects on which product was used, and date of installation.
 2. For construction methods (if specified):
 - a. Detailed description of proposed method.
 - b. Drawings illustrating method.
 3. Such other data as the ENGINEER may require to establish that the proposed substitution is equal to the product, manufacturer or method specified.
- C. In making request for substitution, CONTRACTOR represents that:
 1. CONTRACTOR has investigated proposed substitution, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified.
 2. CONTRACTOR will provide the same or better guarantees or warranties for proposed substitution as for product, manufacturer or method specified.
 3. CONTRACTOR waives all claims for additional costs or extension of time related to proposed substitution that subsequently may become apparent.
- D. A proposed substitution will not be accepted if:
 1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.
 2. It will delay completion of the Work, or the work of other contractors.
 3. It is indicated or implied on a Shop Drawing and is not accompanied by a formal request for substitution from CONTRACTOR.
 4. ENGINEER determines the substitute product is not equal to that specified.
- E. If the ENGINEER determines that a proposed substitute is not equal to that specified, CONTRACTOR shall furnish the product, manufacturer or method specified at no additional cost to ENGINEER.
- F. Approval of a substitution will not relieve CONTRATOR from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECTION (Not Used)

++END OF SECTION++

SECTION 01720

RECORD DOCUMENTS

1.1 GENERAL

- A. If requested by the ENGINEER, CONTRACTOR shall maintain and provide the ENGINEER with record documents as specified below, except where otherwise specified or modified in Divisions 2-16.
- B. Maintenance of Documents:
 - 1. Maintain in CONTRACTOR'S field office or other secure area onsite in clean, dry, legible condition complete sets of the following: Drawings, Specifications, Addenda, approved Shop Drawings, Samples, photographs, Change Orders, other modifications of Contract Documents, test records, survey data, Field Orders, and all other documents pertinent to CONTRACTOR'S Work.
 - 2. Provide files and racks for proper storage and easy access. File in accordance with filing format of Construction Specification Institute (CSI), unless otherwise approved by ENGINEER.
 - 3. Make documents available onsite at all times for inspection by ENGINEER. Failure to keep record documents onsite and up-to-date may be grounds for the ENGINEER to not approval the CONTRACTOR's pay requests.
 - 4. Record documents shall not be used for any other purpose and shall not be removed from the CONTRACTOR'S office without ENGINEER'S approval.
- C. Marking System: Provide colored pencils or felt tipped pens for marking changes, revisions, additions and deletions, to the record set of Drawings. Use following color code unless otherwise approved by the ENGINEER:
 - 1. Process and Mechanical: Red
 - 2. Yard Piping: Red
 - 3. Architectural: Blue
 - 4. Structural: Purple
 - 5. Plumbing: Brown
 - 6. HVAC: Green
 - 7. Other Printed Notations: Black
- D. Recording:
 - 1. Label each document "PROJECT RECORD" in 2-inch high printed letters.
 - 2. Keep record documents current.
 - 3. Do not permanently conceal any Work until required information has been recorded.

4. Drawings: Legibly mark to record actual construction including:
 - a. Depths of various elements of foundation in relation to datum.
 - b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - d. Field changes of dimensions and details.
 - e. Changes made by Change Order or Field Order.
 - f. Details not on original Drawings.
 5. Specifications and Addenda: Legibly mark up each Section to record:
 - a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 - b. Changes made by Change Order or Field Order.
 - c. Other matters not originally specified.
- E. Submittal:
1. Upon Substantial Completion of the Work, deliver record documents to ENGINEER. Final payment will not be made until satisfactory record documents are received by ENGINEER.
 2. Accompany submittal with transmittal letter containing:
 - a. Date.
 - b. Project title and number.
 - c. CONTRACTOR'S name and address.
 - d. Title and number of each record document.
 - e. Certification that each document as submitted is complete and accurate.
 - f. Signature of CONTRACTOR, or his authorized representative.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECTION (Not Used)

++END OF SECTION++

SECTION 02110

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope: The CONTRACTOR shall totally clear the area within the limits of the sewer easement, including but not limited to brush, hedges and trees (unless designated as not to be disturbed on the plans or by direction of the ENGINEER), stumps, logs, pavement, and loose or projecting material as necessary to allow the construction work to be completed. The cleared debris and pavement shall be removed and disposed of off-site unless otherwise approved by the ENGINEER in writing.
- B. Related Sections:
 - 1. Section 02220, Excavation and Backfill.

PART 2 - EXECUTION

2.1 SURVEY MONUMENTATION

- A. Any and all survey monumentation encountered and removed during the course of construction must be put back in its original location at the completion of construction by a Registered Surveyor licensed to do business in the State of Kentucky.

2.2 BLASTING

- A. No blasting is permitted.

2.3 TEMPORARY CLOSURES

- A. Temporary closures shall be erected, maintained and removed at the completion of construction where livestock are in evidence or where directed by the ENGINEER.
- B. Trees designated as not to be disturbed shall be protected from harm by machinery, materials or the construction work.

++ END OF SECTION ++

SECTION 02220

EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals required to perform all excavating, backfilling, filling and grading, and disposing of earth materials as shown, specified, and required for construction of manholes, pipelines, and other facilities required to complete the Work in every respect.
2. All temporary means needed to prevent discharge of sediment to water courses from dewatering systems or erosion are included.
3. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

1.2 QUALITY ASSURANCE

A. Tests:

1. Engage the services of a qualified testing laboratory to make tests and determine acceptability of the fill or material as listed below. Laboratory shall be acceptable to ENGINEER.
2. Field quality control testing will be performed by ENGINEER's testing service. CONTRACTOR shall give full cooperation to ENGINEER's testing personnel so that the required tests can be taken in an efficient and timely manner.
3. Required Tests:
 - a. Compacted Select Fill, Drainage Fill, Subbase Material and Pipe Bedding: Compaction, ASTM D 1556 and ASTM D 698, ASTM D 2922, ASTM D4253, ASTM D4254.

B. Permits and Regulations:

1. ENGINEER will obtain all necessary permits for work in roads, rights-of-way, railroads, etc.
2. CONTRACTOR shall obtain permits as required by local, state and federal agencies for discharging water from excavations.
3. CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

- C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
1. ASTM A 36, Specification for Structural Steel.
 2. ASTM A 328, Specification for Steel Sheet Piling.
 3. ASTM D 422, Method for Particle-Size Analysis of Soils.
 4. ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soils Using Standard Effort (12,400 ft – lbf/cu ft) (600 KN-m/cum).
 5. ASTM D 1556, Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 6. ASTM D 2321, Practice for Underground Installation of Thermoplastic Pipe for Sewer and other Gravity – Flow Applications
 7. ASTM D 2922, In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 8. ASTM D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 9. ASTM D4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 9. AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings.
 10. Kentucky Department of Highways (KDOH), Standard Specifications for Road and Bridge Construction, 2000 Edition.
 11. OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section .650 (Subpart P - Excavations).

1.3 SUBMITTALS

- A. Excavation Plan: Prior to start of excavation operations, submit written plan to demonstrate compliance with OSHA Standard 29 CFR Part 1926.650. As a minimum, excavation plan shall include:
1. Name of competent person.
 2. Excavation method(s) or protective system(s) to be used.
 3. Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.
- B. Shop Drawings: Submit for approval the following:
1. Sheet piling and bracing, or other protective system(s).
 2. Dewatering system.
 3. Anticipated Protection Methods.

Shop Drawings shall be prepared by a licensed professional engineer recognized as expert in the specialty involved. Also submit for approval, calculations and all other pertinent information. CONTRACTOR, however, will be responsible for designing, installing, operating and maintaining the system(s) as required to satisfactorily accomplish all necessary sheet piling, bracing, protection, underpinning and dewatering.

- C. Submit gradation and compaction test reports of all specified soil materials.

1.4 JOB CONDITIONS

- A. Subsurface Information: Refer to Supplementary Conditions for Data on subsurface conditions. Data is not intended as a representation or warranty of continuity of conditions between soil borings nor of groundwater levels at dates and times other than date and time when measured. ENGINEER will not be responsible for interpretations or conclusions drawn therefrom by CONTRACTOR. Data are solely made available for the convenience of CONTRACTOR.
 - 1. Additional test borings and other exploratory operations may be made by CONTRACTOR at no cost to ENGINEER.
- B. Existing Structures: The Drawings show certain surface and underground structures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from damage by CONTRACTOR. If they are broken or damaged, they shall be restored immediately by CONTRACTOR at his expense.
- C. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during all operations.
 - 1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult piping or utility owner and ENGINEER immediately for directions as to procedure. Cooperate with ENGINEER and utility owner in keeping services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 - 2. In general, service lines to individual houses and businesses are not shown; however, CONTRACTOR shall assume that a service exists for each utility to each house or business.
 - 3. Do not interrupt existing utilities serving facilities occupied and used by ENGINEER or others, except when permitted in writing by ENGINEER and then only after acceptable temporary utility services have been provided.
 - 4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.
- D. Protection of Persons and Property: Barricade open excavations occurring as part of the Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 - 1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

- E. Dust Control: Conduct all operations and maintain areas of activity, including sweeping and sprinkling of roadways, to minimize creation and dispersion of dust. Calcium chloride may be used to control serious or prolonged dust problems, subject to approval of ENGINEER.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Select Fill:
 - 1. Place select fill where shown or specified below and around structures, pipelines, roads, tanks, walks, and other work.
 - 2. Use well graded sand and gravel, free from organic matter. A well-graded select fill shall have a uniformity coefficient greater than 6 for sand and greater than 4 for gravel and have a coefficient of gradation between 1 and 3 for sand and gravel. Not more than 70 percent by weight shall pass through a No. 40 sieve; not more than 10 percent by weight shall pass through a No. 200 sieve; and 100 percent shall pass through a 3-inch square sieve.
 - 3. Advise ENGINEER in writing of source and, if required, submit a sample of the material for approval.
- B. General Backfill and Fill Material: Provide approved soil materials for backfill and fill, free of rock thicker than 6 inches or larger than 24 inches maximum in any dimension, debris, waste, frozen materials, vegetable and other organic matter and other deleterious materials. Previously excavated materials meeting these requirements may be used for backfill. All rock shall be excluded from fill within 24 inches of the pipe.
- C. Pipe Bedding Material:
 - 1. Place around pipe and compact for pipe bedding material.
 - 2. Fill shall be clean natural or washed sand and gravel, crushed gravel or crushed stone, free from cementitious substances and flat or flaky particles in an amount to cause caking, packing, yielding or uneven support for the pipe. Lime sand shall not be acceptable. All material shall be of such sizes that one-hundred percent (100%) passes the one and one half (1 ½) inch screen, 40% or less passes the No. 40 sieve, and ten (10) percent or less passes the No. 200 sieve.
 - 3. Fill shall not consist of any organic soil or stone larger than 1½-inch in any dimension.
- D. Control Density Fill:
 - 1. Use for trench backfill located with KYTC right of way.
 - 2. Description:

- a. Flowable fill shall consist of a mixture of cement, sand, fly ash, water and other materials approved by SD1.
- 3. Materials and Mixing Proportioning:
 - a. Cement: 30 lbs.
 - b. Fly Ash, Class F: 300 lbs. Do not allow the loss or ignition for Class F fly ash to exceed twelve (12) percent.
 - c. Natural Sand (S.S.D): 3,000 lbs.
 - d. Water (Maximum): 550 lbs. Water used for the mixture shall be potable and free of oil, salts, acid and other impurities that would have an adverse effect on the quality of the backfill material.
- 4. Properties:
 - a. Average Compressive Strength:
 - 1) 28 days: 50 to 100 psi
 - b. For applications that require early opening to traffic or placement of pavement as soon as possible, provide a mixture with the following properties:
 - 1) Mixture bleeds freely within 10 minutes
 - 2) Mixture shall support a 150-pound person within three (3) hours.

PART 3 - EXECUTION

3.1 INSPECTION

- A. CONTRACTOR shall examine installation site, verify elevations, and observe conditions under which work is to be performed and notify ENGINEER of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.
- B. Provide ENGINEER with sufficient notice and with means to examine the areas and conditions under which excavating, filling, and grading are to be performed. ENGINEER will notify CONTRACTOR if conditions are found that may be detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 SITE PREPARATION

- A. Clear all areas to be occupied by permanent construction or embankments of all trees, brush, roots, stumps, logs, wood and other materials and debris. Clean and strip subgrades for fills and embankments of vegetation, sod, topsoil and organic matter. All waste materials shall be removed from site and properly disposed of by CONTRACTOR. Burning will not be permitted.

3.3 TEST PITS

- A. Where shown or ordered by ENGINEER, excavate and backfill, in advance of construction, test pits to determine conditions or location of existing facilities. Perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling and replacing pavement for the test pits.
- B. Payment for test pits not located on the drawings and as ordered by ENGINEER will be paid for as agreed upon in writing by CONTRACTOR and ENGINEER.
- C. No separate payment will be made for test pits made by CONTRACTOR for his own use.

3.4 EXCAVATION

- A. Perform all excavation required to complete the Work as shown, specified and required. Excavations shall include earth, sand, clay, gravel, hardpan, boulders, bedrock, pavements, rubbish and all other materials within the excavation limits.
- B. Refer to KYTC specifications for Rock Removal.
- C. Excavations for structures and pipelines shall be open excavations. Provide excavation protection system(s) required by ordinances, codes, law and regulations to prevent injury to workmen and to prevent damage to new and existing structures or pipelines. Unless shown or specified otherwise, protection system(s) shall be utilized under the following conditions.
 - 1. Excavation Less Than 5 Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
 - 2. Excavations More Than 5 Feet Deep: Excavations in stable rock may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded or shored and braced.
 - 3. Excavation protection system(s) shall be installed and maintained in accordance with drawings submitted under Article 1.3 above.
- D. Where the structure or pipeline is to be placed below the ground water table, well points, cofferdams or other acceptable methods shall be used to permit construction of said structure or pipeline under dry conditions. Dry conditions shall prevail until concrete has reached sufficient strength to withstand earth and hydrostatic loads and until the pipelines are properly jointed, tested and backfilled. In addition, protect excavation from flooding until all walls and floor framing up to and including grade level floors are in place and backfilling has begun. Water level shall be maintained below top of backfill at all times.

- E. Pumping of water from excavations shall be done in such a manner to prevent the carrying away of unconsolidated concrete materials, and to prevent damage to the existing subgrade.
- F. The elevation of the bottom of footings shown shall be considered as approximate only and ENGINEER may order such changes in dimensions and elevations as may be required to secure a satisfactory footing. All structure excavations shall be hand-trimmed to permit the placing of full widths, and lengths of footings on horizontal beds. Rounded and undercut edges will not be permitted.
- G. When excavations are made below the required grades, without the written order of ENGINEER, they shall be backfilled with compacted gravel or concrete, as directed by ENGINEER, at the expense of CONTRACTOR.
- H. Excavations shall be extended sufficiently on each side of structures, footings, etc., to permit setting of forms, installation of shoring or bracing or the safe sloping of banks.
- I. Subgrades:
 - 1. General Requirements: The backfill shall be maintained at $\pm 3\%$ from optimum moisture content. The compacted fill shall remain firm and intact under all construction operations. Mud, muck, and other soft or unsuitable materials shall be removed.
 - 2. Subgrade Requirements for Roadways: Compact to the degree specified in Section 207 of the KDOH Standard Specifications for Road and Bridge Construction, 2000 Edition.
 - 3. Subgrade Requirements for Pipeline Trench Bottoms, Floor Slabs and Concrete Pads: Compact to at least 95% of the maximum Standard Proctor dry unit weight as determined by ASTM D 698.
 - 4. Subgrade Requirements for Footing Foundations: Compact to at least 98% of the maximum Standard Proctor dry unit weight as determined by ASTM D 698.
 - 5. Soft Subgrades: For subgrades which are otherwise solid, but which become soft or unsuitable on top due to construction operations, remove the soft and unsuitable material and replace with suitable backfill and recompact to the specified density.
 - 6. Finished Elevation of Stabilized Subgrades: Do not place above subgrade elevations shown.
- J. Stability of Excavations:
 - 1. Sides of Excavations: Slope to comply with codes and ordinances of agencies having jurisdiction.
 - 2. Shoring and Bracing: Provide shoring and bracing where sloping is not possible either because of space restrictions or stability of material excavated.
 - 3. Safety: Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

4. Caving: If caving occurs outside the excavation area, backfill the resulting hole in accordance with the requirements of this section after removing loose material.
- K. Pipe Trench Preparation: Trench construction shall be per SD1 pipe bedding and trench condition details as follows
1. No more than 200 feet of trench may be opened in advance of pipe laying.
 2. Trench width shall be minimized to greatest extent practical but shall conform to SD1's standard trench details and the following:
 - a. Flexible Pipe: Sufficient to provide room for installing, jointing and inspecting piping, but a minimum of pipe barrel OD plus two feet for 36" and less diameter pipe. For pipe that is greater than 36" in diameter, the trench width shall be the OD of the pipe plus four feet.
 - b. Rigid Pipe: Sufficient to provide room for installing, jointing and inspecting piping, but a minimum of pipe barrel OD plus two feet for 36" and less diameter pipe. For pipe that is greater than 36" in diameter, the trench width shall be: **$OD + 2*(OD/6)$** .
 - c. Enlargements at pipe joints may be made if required and approved by ENGINEER.
 - d. Sufficient for shoring and bracing, or shielding and dewatering.
 - e. Sufficient to allow thorough compaction of bedding material adjacent to bottom half of pipe.
 - f. Do not use excavating or compaction equipment, which requires the trench to be excavated to excessive width.
 3. Depth of trench shall be as shown. If required and approved by ENGINEER, depths may be revised.
 4. Bedding material shall be carefully placed over the full trench width before the pipe is laid to a depth of at least 6-inches and compacted in maximum of 6-inch lifts over the full trench width. Where pipe is laid in rock excavation, depth of pipe bedding below the pipe shall be at least 6-inches for pipe 24-in. and smaller and 9-inches for pipe 30-in. and larger. After laying pipe, the balance of the bedding material and backfill shall be placed as described herein.
- L. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
1. Locate and retain soil materials away from edge of excavations.
 2. Dispose of excess soil material and waste materials as specified hereinafter.
- M. Where ENGINEER considers the existing material beneath the bedding material unsuitable, CONTRACTOR shall remove same and replace it with compacted select fill or compacted pipe bedding material.

3.5 UNAUTHORIZED EXCAVATION

- A. All excavation outside the lines and grades shown, and which is not approved by ENGINEER, together with the removal and disposal of the associated material shall be at CONTRACTOR'S expense. Unauthorized excavations shall be filled and compacted with select backfill by CONTRACTOR at his expense.

3.6 AUTHORIZED UNDERCUTS

- A. Subgrades for concrete structures and trench bottoms shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud and muck; and shall be sufficiently stable to remain firm and intact under the feet of the workers.
- B. If in the course of excavation as determined by the ENGINEER, unstable soil is encountered at the point of the bottom of the required excavation, the CONTRACTOR shall be authorized to undercut sufficiently to remove all the unstable soil to the limits specified by the ENGINEER.
- C. The CONTRACTOR shall refill the undercuts with select backfill or pipe bedding material and compact same to the requirements set forth in paragraph 3.4.I, unless other means of refill are specified or ordered by the ENGINEER.
- D. The cost of removing and disposing of the unstable material and providing refill material shall be reimbursable to the CONTRACTOR at the contract unit price bid or at a mutually agreeable negotiated unit price between the CONTRACTOR and ENGINEER.

3.7 DRAINAGE AND DEWATERING

- A. General:
 - 1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.
 - 2. Remove water from excavation as fast as it collects.
 - 3. Maintain the ground water level below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for the permanent work, and to prevent damage to the Work during all stages of construction.
 - 4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
 - 5. Obtain ENGINEER'S approval before shutting down dewatering system for any reason.
- B. Standby Requirements for Dewatering: Provide standby equipment to ensure continuity of dewatering operations.
- C. Disposal of Water Removed by Dewatering System:

1. All dewatering flows are to be settled in siltation basins or directed through filtering devices before discharge to stabilized sites, such as streams or sewers; not onto exposed soils, stream banks, or any other site where the flow could cause erosion.
2. Silt from construction operations shall not be permitted to enter the storm sewer system. When construction occurs near storm sewer inlets, erosion control measures such as inlet filters and hay bales shall be used to prevent silt from entering storm sewers.
3. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
4. Dispose of water in such a manner as to cause no inconvenience to ENGINEER, or others involved in work about the site.
5. Convey water from the construction site in a closed conduit. Do not use trench excavations as temporary drainage ditches.
6. CONTRACTOR shall be responsible for complying with all regulatory agency rules pertaining to dewatering and obtaining permits, if required.

3.8 SHEETING, SHORING AND BRACING

A. General:

1. Used material shall be in good condition, not damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary work.
2. All timber used for breast boards (lagging) shall be new or used, meeting the requirements for Douglas Fir Dense Construction grade with a bending strength not less than 1500 psi or Southern Pine No. 2 Dense.
3. All steel work for sheeting, shoring, bracing, cofferdams etc., shall be designed in accordance with the provisions of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", of the AISC except that field welding will be permitted.
4. Steel sheet piling shall be manufactured from steel conforming to ASTM A 328. Steel for soldier piles, wales and braces shall be new or used and shall conform to ASTM A 36.
5. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
6. Unless otherwise shown, specified, or ordered, all materials used for temporary construction shall be removed when work is completed. Such removal shall be made in a manner not injurious to the structure or its appearance or to adjacent Work.
7. Provide permanent steel sheet piling or pressure creosoted timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cutoff tops as required and leave permanently in place.

8. The clearances and types of the temporary structures, insofar as they affect the character of the finished Work, and the design of sheeting to be left in place, will be subject to the approval of ENGINEER; but CONTRACTOR shall be responsible for the adequacy of all sheeting, shoring, bracing, coffer-damming, etc.
9. Safe and satisfactory sheeting, shoring and bracing shall be the entire responsibility of CONTRACTOR.

B. Sheeting Left in Place:

1. Steel sheet piling shown to be left in place shall consist of rolled sections of the continuous interlocking type unless otherwise approved. The type and design of the sheeting and bracing shall conform to the above specifications for all steel work for sheeting and bracing. Steel sheeting designated to be left in place shall be new.
2. Steel sheet piling to be left in place shall be driven straight to the lines and grades as shown or directed. The CONTRACTOR shall determine the grade to which the sheet piling shall be driven. The piles shall penetrate into firm materials with secure interlocking throughout the entire length of the pile. Damaged piling having faulty alignment shall be pulled and replaced by new piling.
3. The type of guide structure used and method of driving for steel sheet piling to be left in place shall be subject to the approval of ENGINEER. Jetting will not be permitted.
4. Cut off piling left in place to the grades shown or ordered by ENGINEER and remove the cut offs from the site.
5. Clean wales, braces and all other items to be embedded in the permanent structure, and ensure that the concrete surrounding the embedded element is sound and free from air pockets or harmful inclusions. Provisions shall include the cutting of holes in the webs and flanges of wale and bracing members, and the welding of steel diaphragm waterstops perpendicular to the centerline of brace ends which are to be embedded.
6. Subsequent to removal of the inside face forms, and when removal of bracing is permitted, cut back steel at least 2 inches inside the wall face and patch opening with cement mortar. Concrete shall be thoroughly worked beneath wales and braces, around stiffeners and in any other place where voids may be formed.
7. Portions of sheeting or soldier piles and breast boards which are in contact with the foundation concrete shall be left in place, together with wales and bracing members which are cast into foundation or superstructure concrete.

C. Removal of Sheeting and Bracing:

1. Remove sheeting and bracing from excavations unless otherwise ordered in writing by ENGINEER. Removal shall be done so as to not cause injury to the Work. Removal shall be equal on both sides of excavation to ensure no unequal loads on pipe or structure.

3.9 TRENCH SHIELDS

- A. Excavation of earth material below the bottom of a shield shall not exceed the limits established by ordinances, codes, laws and regulations.
- B. When using a shield for pipe installation:
 - 1. Any portion of the shield that extends below the mid-diameter of an installed rigid pipe (i.e. RCCP) shall be raised above this point prior to moving the shield ahead for the installation of the next length of pipe.
 - 2. The bottom of the shield shall not extend below the mid-diameter of installed flexible pipe (i.e. Steel, DI, PVC, etc.) at any time and shall be raised above this point prior to moving the shield ahead for the installation of the next length of pipe.
- C. When using a shield for the installation of structures, the bottom of the shield shall not extend below the top of the bedding for the structures.
- D. When a shield is removed or moved ahead, extreme care shall be taken to prevent the movement of pipe or structures or the disturbance of the compacted bedding for pipe or structures. Pipe or structures that are disturbed shall be removed and reinstalled as specified.

3.10 GENERAL REQUIREMENTS FOR BEDDING, BACKFILL, FILL AND COMPACTION

- A. Furnish, place and compact all fill and backfill required for structures and trenches and to provide the finished grades shown and specified, including but not limited to restoration of access roads, construction benches, etc. Unless otherwise specified, backfill and fill may be obtained from on-site sources. Additional materials, if required, shall be furnished from off-site sources at no additional cost to ENGINEER.
- B. Backfill excavations as promptly as Work permits, but not until completion of the following:
 - 1. Acceptance by ENGINEER of construction below finish grade including dampproofing, waterproofing, perimeter insulation, trench construction, and pipe and bedding installation.
 - 2. Inspection, testing, approval, and recording of locations of underground utilities.
 - 3. Removal of concrete formwork.
 - 4. Removal of shoring and bracing.
 - 5. Removal of trash and debris.
 - 6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
 - 7. Placement of settlement plates.

- C. Keep excavations dry during backfilling operations. Bring backfill around structures and piping up evenly on all sides.
- D. Place select backfill material above pipe encasements and as bedding material for pipelines that pass under structures, concrete pavements, or other pipelines. General backfill material may be used above pipe bedding material in other areas. Method of bedding pipe shall be as specified in Section 02610 and as shown on the Drawings.
- E. Place all bedding in pipe trenches in horizontal layers not exceeding 6 inches in depth up to a point 12-inches or more above the top of the pipe and thoroughly compact each layer along the full trench width before the next layer is placed.
- F. Prior to the installation of pipes which are to be installed in fill sections, place the fill as described herein, until a minimum height of 2 feet above the pipe is reached, unless otherwise required in other Sections. The fill for the trench width shall then be excavated and the pipe installed, bedded, and backfilled. The remainder of the fill shall then be placed.
- G. Control the water content of backfill and fill material during placement within the range necessary to obtain the compaction specified. In general, the moisture content of the fill shall be within 3 percent of the optimum moisture content for compaction as determined by laboratory tests. Perform all necessary work to adjust the water content of the material to within the range necessary to permit the compaction specified. Do not place backfill or fill material when free water is standing on the surface of the area where the backfill or fill is to be placed. No compaction of backfill or fill will be permitted with free water on any portion of the material to be compacted.
- H. Do not place or compact backfill or fill in a frozen condition or on top of frozen material. Remove backfill or fill containing organic materials or other unacceptable material and replace with approved backfill material.
- I. Perform Compaction of bedding, backfill and fill with equipment suitable for the type of material placed and which is capable of providing the densities required. CONTRACTOR shall select compaction equipment and submit it and his proposed procedure to ENGINEER for approval.
- J. Compacted bedding, backfill, and fill shall be compacted by at least two coverages of all portions of the surface of each lift by compaction equipment. One coverage is defined as the condition obtained when all portions of the surface of the material have been subjected to the direct contact of the compactor.
- K. Test the effectiveness of the equipment selected by CONTRACTOR at the commencement of compaction by construction of a small section of trench, backfill

or fill within the area where material is to be placed. If tests on this section show that the specified compaction is not obtained, CONTRACTOR shall increase the number of coverages, decrease the lift thicknesses or obtain a different type of compactor. No additional cost to ENGINEER shall be incurred.

- L. Perform backfill around structures using the specified procedures, except that within 10 feet of foundations and underground structures, light compaction equipment shall be used, with the gross weight of the equipment not exceeding 7,000 pounds. Provide equipment that is capable of the required compaction within restricted areas next to structures and around piping.

3.11 PIPE BEDDING

- A. Bedding Pipe: Bed pipe as specified below. Piping refers to the main line pipe as well as any service laterals or connections to the mainline pipe.
 - 1. Trench excavation, backfill, bedding materials and compaction shall conform to the requirements of this Section 02220.
 - 2. Excavate trenches below the pipe bottom by the amount specified below.
 - 3. Remove all loose and unsuitable material from the trench bottom in accordance with 3.6, Authorized Undercuts.
 - 4. Use pipe bedding material as specified in 2.1.C.
 - 5. Where pipe is installed in a trench excavation, pipe bedding shall be carefully placed and compacted over the full trench width before the pipe is laid. Depth of pipe bedding below the pipe shall be at least 6 inches for pipe 24-in. and smaller and 9 inches for pipe 30-in. and larger. After laying pipe, the balance of the bedding shall be placed as described herein.
 - 6. Carefully and thoroughly compact all pipe bedding with equipment that achieves the degree of compaction specified in 3.12 Compaction Specifications.
 - 7. Excavate for bell holes in bedding carefully so as not to disturb the surrounding compacted material and lay pipe so that the bell bears uniformly on the compacted trench bedding material beneath the pipe.
 - 8. Do not lay pipe until the ENGINEER approves the bedding condition. If a conflict exists obtain clarification from ENGINEER before proceeding.
 - 9. Continue placement of bedding material around pipe. Place all bedding and backfilling in pipe trenches in horizontal layers not exceeding 6 inches in depth and thoroughly compact each layer before the next layer is placed. Bedding material shall be sliced or worked-in along the length of the pipeline during each 6-inch layer lift and then compacted.

10. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.
11. Bedding and initial backfill continues to 12 inches above the top of the pipe.
12. See Sewer Trench Compaction Detail that follows this section.

3.11.1 Normal Backfill

- A. After the pipe sections have been embedded up to a point 12-inches or more above the top of the pipe, the pipe sections have been encased in concrete, or the structures or appurtenances have been constructed, as specified on the drawings, the remainder of the trench or excavated area shall be backfilled using trench or structure excavated material if it meets the requirements set forth under 2.1.B. General Backfill and Fill Materials. If the material does not meet these requirements, the trench or structure excavated material shall be wasted and suitable imported material shall be used for backfill.
- B. Backfill shall be placed in horizontal loose lifts not exceeding 8 inches in thickness and shall be mixed and spread in a manner assuring uniform lift thickness after placing. Backfill shall then be compacted as specified under 3.12 Compaction Specifications up to existing ground level or finished grade level if same has been established.

3.11.2 Rock Backfill

- A. Where the trench is located in areas from which rock had to be excavated in a quantity other than isolated stones, the excavated rock may be used as part of the backfill above a point 2 feet or more above the top of the pipe, or above a point 1 foot above pipe encasement, but shall not be used under pavement areas, unless specifically authorized by the ENGINEER.
- B. The rock fragments used in the backfill shall not exceed rock thicker than 6 inches or larger than 24 inches maximum in any dimension, shall not be dropped into the trench directly over the pipe centerline and shall be used with sufficient smaller dimensioned material so that voids between larger fragments shall be filled. Compaction shall meet the requirements specified under 3.12 Compaction Specifications up to existing ground level or finished grade level if same has been established.
- C. Rock shall not be used in the top 12-inches of the backfill, except across creeks, gullies, ravines or areas designated by the ENGINEER, where the rock may be used to the existing ground level as specified on the drawings.

3.12 COMPACTION SPECIFICATIONS

A. Requirements based on material types are as follows:

1. Select Fill, Drainage Fill and Pipe Bedding: For fill and bedding beneath structures and foundations, compact granular materials that exhibit a well-defined moisture density curve to at least 98 percent of the standard proctor maximum dry density (ASTM D698). For all other fill and bedding, compact granular materials that exhibit a well-defined moisture–density curve to at least 95 percent (ASTM D698). Moisture-condition fill materials to within a range of two (2) percent below to three (3) percent above optimum moisture content (ASTM D698). Compact granular materials that do not exhibit a well-defined moisture-density curve to at least 85 percent relative density (ASTM D4253 and D4254) beneath structures and foundations, and to at least 75 percent relative density (ASTM D4253 and D4254) for all other areas.
 2. General Fill and Backfill: Compact materials that exhibit a well-defined moisture density curve to at least 98 percent of the standard proctor maximum dry density (ASTM D698) beneath structures, foundations and the top one (1) foot below pavements, and at least 95 percent (ASTM D698) in all other areas. Moisture-condition fill materials to within a range of two (2) percent below to three(3) percent above optimum moisture content (ASTM D698). Compact granular or rock materials that do not exhibit a well-defined moisture-density curve to at least 85 percent relative density (ASTM D4253 and D4254) beneath structures and foundations, and to at least 75 percent relative density (ASTM D4253 and D4254) for all other areas.
- B. If the specified densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly functioning compaction equipment, or because of soil moisture content, the CONTRACTOR shall perform whatever work is required to provide the required densities. This work shall include complete removal of unacceptable bedding, backfill or fill areas, and replacement and recompaction until acceptable densities are provided.
- C. CONTRACTOR shall repair, at his own expense, any Settlement that occurs within the construction area. He shall make all repairs and replacements necessary within 30 days after notice from ENGINEER.

3.13 DISPOSAL OF EXCAVATED MATERIALS

- A. Material removed from the excavations which does not conform to the requirements for fill or is in excess of that required for backfill shall be hauled away from the project site by the CONTRACTOR and disposed of in compliance with ordinances, codes, laws and regulations at no additional cost to the ENGINEER.

3.14 ENVIRONMENTAL PROTECTION AND RESTORATION

- A. CONTRACTOR shall be responsible for complying with all regulatory requirements pertaining to environmental protection and restoration. CONTRACTOR shall follow all erosion control design provisions shown in the Erosion Prevention and Sediment Control Plan, drawings, and specifications. CONTRACTOR shall provide, install, and maintain additional erosion and sediment control measures as necessary to retain disturbed sediments on-site.
- B. All disturbed areas of the site shall be stabilized. Stabilization shall begin within 7 days on areas of the site where construction activities have permanently or temporarily (for 30 days or more) ceased. When snow cover causes delays, stabilization shall begin as soon as possible. Stabilization practices include seeding, mulching, placing sod, planting trees or shrubs, and using geotextile fabrics and other appropriate measures.

3.21 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: The ENGINEER's testing service must inspect and approve subgrades and fill layers before construction work is performed thereon. Tests of subgrades and fill layers shall be taken as follows:
 - 1. Compacted bedding material beneath and around pipe in trenches: Make at least one field density test of compacted bedding at the start of the project to ensure CONTRACTOR's method of compacting the bedding is meeting the compaction requirements. ENGINEER shall periodically call for tests of bedding compaction as the Work progresses and if the CONTRACTOR's pipe placement operations differ from proper procedures.
- B. If testing service reports or inspections show subgrade, fills, or bedding compaction are below specified density, CONTRACTOR shall remove any unacceptable materials as necessary and replace with specified materials and provide additional compaction at the CONTRACTOR's sole expense until subgrades, bedding, and backfill are acceptable as specified herein. The costs for the retesting of these subgrade, fills, or bedding materials that did not originally meet the specified density shall be paid by the CONTRACTOR.

+ + END OF SECTION + +

SECTION 02400

TUNNELING, JACKING AND BORING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope: CONTRACTOR shall provide all labor, materials, equipment, supervision and incidentals required to furnish and install casing pipe and carrier pipe as shown on the Plans or specified herein.
 - 1. The CONTRACTOR'S attention is directed to the methods described herein and shown on the drawings for installing the casing pipe below existing facilities. They are jacking and boring method.
 - 2. Horizontal and vertical tolerance for the crossings shall be limited to the requirements herein. Should the tolerances be exceeded, it shall be at the option of the ENGINEER to: accept the installation; abandon the installation at the CONTRACTOR'S expense and require a new installation; or require a combination of hand-mined tunnel and casing pipe at the CONTRACTOR'S expense.
- B. Coordination: CONTRACTOR shall carefully coordinate work at crossings to avoid existing utilities.
- C. Related Work Specified Elsewhere:
 - 1. Section 02220, Excavation and Backfill.
 - 2. Section 03300, Cast-In-Place Concrete.
 - 3. Section 02610, Pipe and Fittings

1.2 QUALITY ASSURANCE

- A. Installer's Qualifications and Experience:
 - 1. Installer shall be a specialist in the construction of casing pipes by jacking, and boring and shall have at least 5 years experience in this specialty. Installer shall have satisfactorily constructed completely in his own name, during the past 5 years not less than ten similar installations which are comparable in diameter and length to that shown and specified herein.
 - 2. The CONTRACTOR chosen to perform this work shall present evidence to prove to the satisfaction of the ENGINEER that his company and the superintendent he will employ for this Project have experience in boring and jacking through ground similar to that found on the Project. The CONTRACTOR shall keep such a superintendent continuously employed until the boring and jacking work is completed.

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3. Use only personnel thoroughly trained and experienced in the skills required. The field supervisor of boring operations and the boring machine operator shall have not less than 12 months experience in the operations of the equipment being used.
4. Welds shall be made only by experienced welders, tackers and welding operators who shall have at least 10 years experience in this specialty. Welders previously qualified by tests as prescribed in the American Welding Society, AWS D.1.1 to perform the type of work required are adequate but a certified welder is not required. See additional requirements in Section 02610.
5. Perform topographical surveys prior to the beginning of any excavation in the area and upon completion of the carrier pipe installation and backfilling. CONTRACTOR shall restore all existing surface and sub-surface facilities damaged due to measurable settlement at no additional cost to the ENGINEER.
6. See requirements for vibration, movement and crack monitoring specified in Section 02610.

B. Permits:

1. Where permits are required, the ENGINEER shall be responsible to obtain and pay for all permits, insurance and bonds required completing the work.
2. The CONTRACTOR shall obtain copy of the permits and be familiar with all necessary requirements of the agencies having jurisdiction prior to starting any boring or jacking operations. Adequate means shall be provided and dewatering shall be performed prior to excavation to keep the work free from water.

C. Requirements of Regulatory Agencies: Comply with the OSHA Standards, Underwriter Laboratories, Kentucky Transportation Cabinet and all other authorities having jurisdiction.

D. Tolerances:

1. The casing pipes shall be installed on the lines and grades shown on the Plans and within tolerances required to allow the sewer pipe to be installed in accordance with the lines and grades shown on the plans.
2. The maximum allowable tolerances are as follows:
 - a. Allowable Horizontal Tolerance (ft): 0.5 feet
 - b. Allowable Vertical Tolerance (ft): 0.5 feet at specified minimum or greater slope.
3. Refer to paragraph 3.1, herein.

D. Reference Standards:

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1. ANSI B16.1, Cast Iron Pipe Flanges and Flanged Fittings.
2. ANSI B18.2.1, Square and Hex Bolts and Screws Inch Series, Including Hex Cap Screws and Lag Screws.
3. ANSI B18.2.2, Square and Hex Nuts.
4. ANSI B36.10, Welded and Seamless Wrought Steel Pipe.
5. ASTM A 53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
6. ASTM A 105, Carbon Steel Forgings for Piping Applications.
7. ASTM A 106, Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service.
8. ASTM A 123, Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
9. ASTM A 134, Pipe, Steel, Electric-Fusion (Arc)-Welded (Sizes NPS 16 and Over).
10. ASTM A 135, Electric-Resistance-Welded Steel Pipe.
11. ASTM A 139, Electric-Fusion (ARC Welded) Steel Pipe.
12. ASTM A 153, Zinc-Coating (Hot Dip) on Iron and Steel Hardware.
13. ASTM A 181, Carbon Steel Forgings, for General-Purpose Piping.
14. ASTM A 252, Welded and Seamless Steel Pipe Piles.
15. ASTM A 307, Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
16. ASTM A 354, Specification for Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners.
17. ASTM A 569, Carbon Steel, Hot-Rolled Sheet and Strip, Commercial Quality.
18. AREA Chapter 1, Part 4, "Jacking Culvert Pipe through Fills".
19. AREA Chapter 1, Part 5, "Specification for Pipelines Conveying Non-Flammable Substances".
20. AWS D1.1, Structural Welding Code.
21. OSHA.

1.3 SUBMITTALS

- A. Installation Methods: Before starting work, the CONTRACTOR shall submit drawings and descriptions showing methods and equipment for the excavation of the jacking pits and installation of the casing pipes and the carrier pipe for approval by the ENGINEER. The CONTRACTOR shall prepare a report of anticipated construction method information, dewatering methods, jacking pit elevations and profile of proposed bore. The report shall be submitted to the ENGINEER.
- B. Technical data, test reports, work schedules and any other information required by the authority having jurisdiction.

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- C. Certificates: Certificate of Conformance in accordance with paragraph 21.1. of ASTM A139.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 - 1. Exercise special care during delivery not to damage the casing pipe, exterior coatings, and carrier pipe.
 - 2. Damaged materials will be rejected by the ENGINEER'S Project Representative and replaced by the CONTRACTOR at his expense.
 - 3. Deliver materials to such locations so as to avoid excessive handling.
 - 4. The ENGINEER is not responsible for accepting shipments of any kind.
- B. Storage:
 - 1. Store casing pipe and carrier pipe on approved blocking for protection from corrosion until incorporation into the Work in accordance with manufacturer's recommendation.
 - 2. Store in areas shown on the Plans or as approved by the ENGINEER'S Project Representative.
 - 3. The ENGINEER shall be permitted access to inspect the materials in storage areas.
- C. Handling:
 - 1. Handle materials in a manner so as to avoid damage.
 - 2. Materials damaged during handling shall be repaired or replaced as ordered by the ENGINEER'S Project Representative.

1.5 JOB CONDITIONS

- A. Subsurface Information:
 - 1. The ENGINEER has not prepared a subsurface investigation report.
 - 2. CONTRACTOR shall refer to the Supplementary Conditions for requirements on subsurface information.
 - 3. Data on subsurface conditions is not intended as a representation or warranty of continuity of such conditions between soil borings. ENGINEER will not be responsible for interpretation or conclusions drawn therefrom by CONTRACTOR.
 - 4. Additional test borings and other exploratory operations may be made by CONTRACTOR at no cost to ENGINEER.
- B. Existing Structures: The Drawings show certain existing facilities and surface and underground structures located on or adjacent to the Work.

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This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of CONTRACTOR. CONTRACTOR shall explore ahead of the required Work to determine the exact location of all structures. They shall be supported and protected from damage by CONTRACTOR. If they are broken or damaged, they shall be restored immediately by CONTRACTOR at his expense.

- C. Existing Utilities: Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during all operations.
1. Should uncharted or incorrectly charted piping or utilities be encountered during Work, consult ENGINEER immediately for directions as to procedure. Cooperate with ENGINEER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 2. Do not interrupt existing utilities serving facilities occupied and used by ENGINEER or others, except when permitted in writing by ENGINEER and then only after acceptable temporary utility services have been provided.
 3. Coordinate with utility companies for shut-off of services, if required and the lines are active.
 4. See additional requirements specified on the Contract Drawings.
- D. Protection of Persons and Property: Barricade open excavations occurring as part of this Work. Obtain approval of ENGINEER prior to use of warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required, per approval of ENGINEER.
- Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- E. Topographic mapping shown on plan/profile drawings was derived using photogrammetric survey methods. The mapping should be regarded as accurate within normal tolerance for 2-foot contour interval photogrammetric mapping as of the date of photography.
- F. The ground profiles and vertical alignments shown on plan/profile drawings are derived from the topographic mapping and therefore are approximate.
- G. Use of Explosives: Do not bring explosives onto site or use in the Work. Use of explosive materials is specifically prohibited.

- H. Dust Control: CONTRACTOR shall conduct all operations and maintain the area of activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. Calcium chloride shall be used to control serious or prolonged dust problems, subject to approval of ENGINEER.
- I. All excavations shall be sheeted, shored and braced as required to prevent subsurface subsidence. Refer to Section 02220 for additional requirements.
- J. Boring pits shall be kept dewatered, and pumps shall be attended on a 24-hour basis, if conditions so require. Close observation shall be maintained to detect any settlement or displacement of facilities during dewatering operations. Dewater into a sediment trap and comply with applicable environmental protection criteria specified elsewhere in these Contract Documents.
- K. Maintain the air in the pipe, when hand excavating, in a condition suitable for the health of workmen at all times.

1.6 GUARANTEE

- A. Guarantee of Work completed by the CONTRACTOR shall be as specified in the General Conditions of these specifications, except that longer periods may be required where noted in the permits or specified by applicable authorities.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Steel Casing Pipe:
 - 1. Casing pipe shall be steel pipe meeting the requirements as specified in Section 02610 and herein.
 - 2. Unless otherwise called for, casing pipe shall be smooth-wall steel pipe of welded steel construction conforming to ASTM A-139, Grade B, with butt welded joints when more than one length is used. The steel casing pipe shall be of new material with a minimum yield point of 36,000 psi.
 - 3. Sections of the casing pipe shall be welded together to form a continuous conduit capable of resisting all stresses, including jacking stresses. Welding of the steel casing pipe shall be solidly butt-welded with a smooth non-obstructive joint inside. Casing pipe shall be designed for earth cover shown on the Drawings and live load including impact equal to HS-20 wheel loading for roadway crossings.

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4. Minimum wall thickness shall be 0.500 inch. Deflection of installed casing pipe shall not exceed five percent (5.0%). Inside diameter shall be 4-inches minimum greater than outside diameter of gravity sewer or force main at joints or couplings.
 5. If the casing pipe is furnished in sections and requires field welding, then it shall be furnished with plain ends, mill beveled for field butt welding. Field welded joints shall be performed by experienced welders as specified in paragraph 1.2.A.4 above and be full penetration single-vee groove, butt type welds around the entire circumference of the pipe. All welding shall receive testing as specified in Section 02610. Copies of test reports shall be submitted to the ENGINEER.
 6. Coatings: No exterior and interior coatings of the casing pipe are required
 7. CONTRACTOR may use a mechanical joint type pipe in lieu of welded joints. The pipe joint shall be flush with the inside and outside diameter. The joints shall be manufactured by Permalok Corporation or ENGINEER approved equal.
- B. Carrier Pipe: Refer to Section 02610 for carrier pipe requirements. Inside tunneling or casing pipe, all carrier pipe shall be harnessed or restrained with casing spacers.
- C. Casing Spacers and End Seals
1. As specified in Section 02610.

PART 3 – EXECUTION

3.1 GENERAL

- A. Installation of the crossings shall be by jacking and boring and shall conform in all respects to the requirements contained herein and other applicable standards.
- B. Lines and Grades: The CONTRACTOR is responsible for establishing and maintaining proper line and grade at each crossing.
 1. The CONTRACTOR shall periodically check his line and grade to assure conformance with line and grade shown on the Plans and within the tolerances indicated in this Section.
 2. Extra work required because of the CONTRACTOR'S failure to maintain the proper line and grade, as shown on the Plans, shall be performed, by the CONTRACTOR, at no additional cost to the ENGINEER.

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3. The casing pipe and carrier pipe in its final position shall be straight and true in alignment and grade, as indicated on the drawings. Sufficient deviation from line or grade, in the opinion of the ENGINEER or ENGINEER, shall be justification for disapproving the installation. No space shall be left unfilled between the earth and the outside of the casing.

3.2 INSPECTION

- A. As required by the ENGINEER, Sanitation District No. 1 of Northern Kentucky Representative; or other regulatory authority.

3.3 PREPARATION

- A. Work pits at each end of the crossings shall be sufficiently large to permit satisfactory installation of the casing pipe or tunnel liner plates. All excavation, backfill, sheeting, shoring, bracing, and dewatering shall comply with the applicable requirements of Section 02220 of these Specifications and the requirements of the applicable authorities.
- B. All pits and their locations necessary in the performance of this work shall be acceptable to the ENGINEER, ENGINEER, and the agency having jurisdiction prior to starting work. All pits shall be adequately sheeted to protect the work, all persons, and adjacent property. The CONTRACTOR shall provide all additional shields, headers, or stabilization of the pit faces, as required by the ENGINEER, to prevent settlement or damage to the areas above the casing. The CONTRACTOR shall be completely responsible and liable for protecting the work and adjacent property and for any damages that may result due to insufficient stabilization.
- C. The CONTRACTOR shall dispose of excess excavated material or drilling mud/cuttings in an approved upland disposal site.

3.4 INSTALLATION

- A. Installation of Steel Casing Pipe by Jacking:
 1. Install in accordance with current American Railroad Engineering Association Specifications requirements.
 2. Design bracing and backstops and use jacks of sufficient rating such that jacking can be accomplished in a continuous manner until the leading edge of the pipe reaches the final positions shown on the Plans.
 3. If voids develop around the casing pipe as it is jacked, pump cement grout to fill all such voids, or fill by other means acceptable to the ENGINEER'S Project Representative.

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4. Fill all voids as specified hereafter as soon as possible after completion of jacking operation.
- B. Installation of Steel Casing Pipe by Boring:
1. The boring method shall consist of pushing the pipe into the fill with a boring auger rotating inside the pipe to remove the soil.
 2. Provide the front of the casing pipe with suitable mechanical arrangements or devices that will positively prevent the auger and cutting head from leading the pipe so that there will be no unsupported excavation ahead of the pipe.
 3. The equipment and mechanical arrangements or devices used to bore and remove the earth shall be removable from within the casing pipe in the event an obstruction is encountered.
 4. The face of the cutting edge shall be arranged to provide reasonable obstruction to the free flow of soft or poor soil.
 5. Do not use water or other liquids to facilitate casing emplacement or spoil removal.
 6. If voids develop around the casing pipe as it is bored, pump cement grout to fill all such voids, or fill by others means acceptable to the ENGINEER'S Project Representative.
 7. Fill all voids as specified hereinafter as soon as possible after completion of boring operation.
- C. Obstructions: If an obstruction is encountered during installation to stop the forward action of the casing pipe, and it becomes evident that it is impossible to advance the pipe, the CONTRACTOR shall continue the casing pipe by hand tunneling and installation of tunnel liner plates. The continuation by the tunneling method shall be at the CONTRACTOR'S expense and at no additional cost to the ENGINEER.
- D. Installation of the Gravity Sewer:
1. After completion of the tunnel or steel casing pipe, the Gravity Sewer pipe shall be installed and pressure tested by an approved method.
 2. Care shall be taken to prevent undue disturbances of the joints.
 3. The sewer pipe shall be laid on the line and grade shown on the Plans.
 4. The sewer pipe shall be blocked in place, using stainless steel casing spacers as specified in Section 02610.
 5. The sewer pipe shall be installed with casing spacers in a centered/restrained position.
 6. The CONTRACTOR shall repair, replace or take whatever action is deemed necessary by the ENGINEER to correct all disturbed joints at no additional cost to the ENGINEER.

- E. End Seals:
1. After the sewer pipe is installed in the steel casing, and successfully pressure tested, construct end seals as shown on the Drawings and as specified herein.
 2. Prior to the installation of end seals, the sewer pipe shall be properly and sufficiently secured against flotation and against all movement, which would disturb joints.
 - a. The CONTRACTOR shall be responsible for all joints.
 - b. The CONTRACTOR shall repair, replace, or take whatever action is deemed necessary by the ENGINEER'S Project Representative to correct all disturbed joints at no additional expense to ENGINEER.
- F. Dewatering:
1. Dewatering shall be performed in accordance with the criteria specified in Sections 02220 and 02610.

++ END OF SECTION ++

SECTION 02606

MANHOLES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope: CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown on the Design Drawings, specified herein and required to furnish and install all precast manholes.
- B. General:
 - 1. Manholes shall conform in shape, size, dimensions, material, and other respects to the details shown or as ordered by ENGINEER.
 - 2. Cast-iron frames and covers shall be as specified in Section 05540.
 - 3. Concrete for cast-in-place manholes and for inverts in precast manholes shall conform to the requirements specified under Section 03300.
- C. Related Sections:
 - 1. Division 2 Sections on Earthwork.
 - 2. Section 03300, Cast-In-Place Concrete.
 - 3. Section 05540, Castings.

1.2 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. ASTM C 33, Standard Specification for Concrete Aggregate.
 - 2. ASTM C 76, Class III Reinforced Concrete Pipes.
 - 3. ASTM C 443, Specifications for Joints for Circular Concrete Sewer and Culvert Pipe, using Rubber Gaskets.
 - 4. ASTM C 478, Specification for Precast Reinforced Concrete Manhole Sections.
 - 5. ASTM C 579, Standard test method for compressive strength of chemical resistant mortars, grouts, monolithic surfacing and polymer concretes.
 - 6. ASTM C 857, Standard Practice for Minimum Structural Design Loading for underground Precast Concrete Utility Structures.
 - 7. ASTM C 923, Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
 - 8. ASTM D 695, Standard Test Method for Compressive Properties of Rigid Plastics.

9. ASTM D 790, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
10. ASTM C 990, Standard Specification for Joints for Concrete Pipe, Manholes, Precast Box Sections Using Preformed Flexible Joint Sealants.
11. ASTM C 1244, Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
12. ASTM D 1737, Test Method for Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus
13. ASTM D 2240, Standard Test Method for Rubber Property
14. ASTM D 412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension
15. ASTM D 4161, Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
16. ASTM D 6783, Standard Specification for Polymer Concrete Pipe.
17. ASTM F 477, Specification for Elastomeric Seals (gaskets) for Joining Plastic Pipe.
18. ASTM 4060, Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
19. ASTM 4541, Standard Test Method for Pull Off Strength of Coatings using Portable Adhesion Testers
20. AWWA C 110, Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
21. AWWA C 111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings. AWWA C 115, Flanged Ductile-Iron Pipe with Threaded Flanges.
22. AWWA C 151, Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
23. AWWA C 302, Reinforced Concrete Pressure Pipe, Noncylinder Type, for Water and Other Liquids.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
 1. Manufacturer's name for all precast structures.
 2. Design Drawing showing design and construction details of all precast concrete and cast-in-place manholes including details of joints between the manhole bases and riser sections and stubs or openings for the connection of sewers. Design Drawings shall show invert elevations of all pipe connections entering and leaving the manhole along with flowline slope across the base.

- B. Submit a laying schedule of each manhole showing elevations and manhole components to be used from base to casting.
- C. Comply with all the requirements of Section 01340.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE MANHOLES

- A. General:
 - 1. Precast manholes shall conform to the details shown on the Standard Details.
 - 2. Concrete shall be minimum 4000 psi compressive strength.
 - 3. Except where otherwise specified precast manhole components shall consist of reinforced concrete pipe sections especially designed for manhole construction and manufactured in accordance with ASTM C 478 except as modified herein.
 - a. Standard Manholes shall be six (6) feet or more in depth, measured from the base of the cover frame to the invert of the outlet and shall be concentric cone-type, top construction as shown on the Design Drawings.
 - 4. Precast, reinforced concrete manhole bases, riser sections, flat slabs and other components shall be manufactured by wet cast methods only, using forms which will provide smooth surfaces free from irregularities, honeycombing or other imperfections.
 - 5. All precast manhole components shall be of approved design and of sufficient strength to withstand the loads imposed upon them. They shall be designed for a minimum earth cover loading of 130 pounds per cubic foot, an H-20 wheel loading, and an allowance of 30 percent in roadways and 15 percent in rights-of-way for impact.
 - 6. Precast concrete manhole sections (including eccentric and concentric cones, risers and grade rings) shall conform to ASTM C 478 except sections deeper than 12 feet shall have reinforcing equal to that of ASTM C76 Class III reinforced concrete pipes, unless otherwise noted on the Design Drawings.
 - 7. Lifting holes, if used in manhole components, shall be tapered, and no more than two shall be cast in each section. Tapered, solid rubber plugs shall be furnished to seal the lifting holes. The lifting holes shall be made to be sealed by plugs driven from the outside face of the section only.
 - 8. Mark date of manufacture, manhole number as shown on the Design Drawings, and name or trademark of manufacturer on inside of barrel.
- B. Manhole Bases Sections:

1. Precast concrete manhole base sections shall be "monolithic", consisting of base slab and base riser (barrel) section.
 - a. Precast concrete manhole base slab thickness shall comply with the following schedule:

0.0' – 15.0'	Vertical Height	- 8" Slab
15.1' – 20.0'	Vertical Height	- 10" Slab
20.1' – 25.0'	Vertical Height	- 12" Slab
25.1' – 30.0'	Vertical Height	- 14" Slab
 - b. Manholes over 30 feet shall be designed by a Professional Engineer registered in the State of Kentucky. Submittals shall be provided to SD1 for review & approval.
 - c. Manhole bases shall have two cages of reinforcing steel in their walls, each of the area equal to that required in the riser sections. Wall thickness shall not be less than 5 inches.
 - d. There should be a minimum of twelve (12") inches between the outside diameters of all pipe penetrations in the base section.
 - e. Base riser shall extend a minimum twelve (12) inches above the top of the highest pipe in the base.
 2. Flow channel (invert) and apron (bench) shall be poured separately at the point of manufacture to the dimensions shown on the Design Drawings.
 - a. The flow channel through manholes should be made to conform in shape and slope to that of the sewers.
 - b. Invert shall be smooth and semi-circular in cross-section of the same diameter of the pipe leaving the manhole.
 - c. Changes of direction of flow or sewer centerline within the manhole shall be made by forming the flow channel along a smooth curve with as long radius as the inside of the manhole will allow.
 - d. Bench shall slope toward invert at not less than one (1) inch per foot.
 3. All precast base sections with pipe openings shall be furnished with ASTM C 923 pipe-to-manhole connector gaskets as specified hereinafter.
- C. Manhole Barrel Sections:
1. Manhole barrel sections shall have reinforcing steel in their walls, Wall thickness shall not be less than 5 inches.
 2. The barrel of the manhole shall be constructed of various lengths of riser pipe manufactured in increments of one foot to provide the correct height with the fewest joints. Openings in the barrel of the manholes for sewers or drop connections will not be permitted closer than one foot from the nearest joint. Special manhole base or riser sections shall be furnished as necessary to meet this requirement.

3. The barrel sections shall be of the height required, but not less than one (1) foot in height. No opening shall be cut into a barrel section, the maximum dimension of which exceeds one-half (1/2) the section height.
 4. Joints between manhole components shall be the tongue and groove. The circumferential and longitudinal steel reinforcement shall extend into the tongue and groove ends of the joint without breaking the continuity of the steel. Joints between the base sections, riser sections and top slabs of manholes 72 inches in diameter and less shall be rubber and concrete joints. Joints for manhole components greater than 72 inches in diameter shall be provided with steel bell and spigot rings.
 5. Precast manhole section joints shall be joined with one of the following products:
 - a. ASTM C 443, a single, continuous rubber O-ring gasket and shall conform to AWWA C302.
 - b. ASTM C-990, flexible butyl resin sealant such as Conseal CS-102, CS-202 as manufactured by Concrete Sealants, Inc.
 - c. Hamilton-Kent "Kent-Seal No. 2"
 - d. K.T. Snyder Co. "Rub'r-Nek"
 - e. Press Seal Gasket "E-Z Stik"
 6. All precast barrel sections with pipe openings shall be furnished with ASTM C 923 pipe-to-manhole connector gaskets as specified hereinafter.
- D. Cone Sections and Top Slab:
1. A precast concentric cone or precast top slab shall be provided at the top of the manhole barrel to receive the cast iron frame and cover or floor access hatch cover as shown on the Design Drawings. Eccentric cones will be evaluated on a case by case basis.
 2. Cone sections and top slabs shall be designed for an H-20 wheel loading, and an allowance of 30 percent in roadways and 15 percent in rights-of-way for impact.
 3. Cone sections for standard manholes shall have a minimum 8" thick upper walls and shall not exceed 3'-0" in height.
 4. Concrete top slabs shall not be less than 8 inches thick.
- E. Drop Manhole:
1. Drop Manholes shall conform to all provisions specified herein, with the additional requirements for the drop pipe as shown on the Design Drawings.
 2. The drop pipe shall be of the same material and diameter as the inlet sewer pipe used.
 3. Drop pipe shall be totally enclosed in concrete, formed, with a minimum covering dimension of six (6) inches.

4. No drop pipes shall be allowed inside of the manholes, unless otherwise approved by SD1.
 5. Base shall be cast to support drop connection.
- F. Acceptable Manufacturers
1. Aerocrete.
 2. Sherman Dixie.
 3. KOI.
 4. Hanson.
 5. Or equal.
- F. Joints:
1. Joints at pipe tie-ins shall be ASTM C923 flexible pipe-to-manhole connector gaskets, as specified in Section 2.4. Joints shall be watertight. The connector gaskets shall be integral with the manhole wall. Walls shall have sufficient thickness to install the connector within the hole cored in the manhole wall. Pipe stubs cast into the manhole through the wall to provide the additional wall thickness are not acceptable and will not be allowed.
- F. Fittings:
1. Cones, reducer slabs, base slabs and adjusting rings shall be of the same material as adjoining riser sections.
 2. Fittings shall be manufactured elastomeric gaskets, epoxy bonding or fiberglass overlay.
- F. Manhole Steps:
1. Furnish steel-reinforced polypropylene steps as specified in Section 2.6.
 2. No steps shall be aligned over the flow channel.
 3. Step spacing is 16" as indicated on the Standard Drawings.

2.3 MISCELLANEOUS METALS

- A. Metal frames and covers, steps, and similar required items shall be provided as shown on the Design Drawings and in accordance with Sections 05540.

2.4 FLEXIBLE PIPE JOINT SEAL

- A. A flexible pipe joint seal shall be provided in the connection of pipe to manholes and other miscellaneous structures. The rubber seal shall meet the requirements given in ASTM C 923. The seal shall be of a size specifically designed for the pipe size and material.
- B. All connecting elements of the seal shall be Type 304 stainless steel.

- C. Flexible pipe joint seal shall allow for pipe alignment of up to fifteen (15) degrees deflection.
- D. Pipes entering manholes that do not have existing flows and have slopes greater than twenty –six (26) percent shall have fittings (22.5 or 11.25 degree bends) installed immediately outside the manhole.
- E. If a flexible pipe joint seal is provided at each manhole wall penetration and the pipe is not rigidly locked into the manhole wall through grouting or other methods, then the 12” maximum pipe stub shown in the SD1 Standard Drawing No. 113 is not required.
- F. Acceptable Products:
 - 1. Kor-N-Seal by NPC, Inc.
 - 2. A-Lok by A-LOK Products, Inc.
 - 3. Dura-Seal III by Dura-Tech.
 - 4. Or equal.

2.5 MANHOLE STEPS

- A. Plastic manhole steps shall be PS1-PF (Press Fit polypropylene plastic) as manufactured by MA Industries, or equal. Steps shall be driven into specially sized holes cast into the manhole section. Holes shall be formed in the manhole section using an insert plug that is removed upon curing.
- B. No steps shall be aligned over the flow channel. Step spacing shall be 16” as shown the Standard Detail Drawing.

2.6 MANHOLE RISERS

- A. Manhole risers (adjusting rings) 6” to 10” height shall be concrete.
- B. Manhole risers 2” to 4” height shall be high density polyethylene as manufactured by Ladtech, Inc.

PART 3 - EXECUTION

3.1 MANHOLE BASES

- A. General
 - 1. Manholes shall be constructed at the locations shown on the Design Drawings.
 - 2. The dimensions shall be as shown on the detail sheets and the depths shall be as indicated by either finished top elevation given or depth dimension given on the plans.

3. Perform Sitework as per the requirements of Sections 02110 and 02220.
 4. Excavation for manholes and other underground structures shall be of sufficient size to adequately accommodate installation and proper centering.
 5. The bases shall be placed directly on an 8-inch to 12-inch deep pad (compacted thickness) of pipe bedding material as specified in Section 02220, placed to proper elevation and leveled, unless a deeper excavation is required to remove any loose sandy soils or soft to medium stiff, clayey soils down to a soil stratum suitable for support of the manhole and base.
 - a. The excavated soils shall be replaced with an appropriate Structural Backfill material or with controlled, low-strength material (CLSM), lean concrete, or an extra thickness of manhole base concrete.
 6. The excavation shall be kept free of water while the manhole is being constructed and manhole shall not be backfilled until inspected by the ENGINEER.
 7. CONTRACTOR will be required to compact bedding material around the entire circumference of the manhole and manhole excavation area to at least 12-inches above the highest incoming or outgoing pipe.
 8. Compacted backfill as specified on the Design Drawings or Section 02220 shall then be placed above the compacted bedding material up to finished grade.
- B. Pre-Cast Bases
1. The ENGINEER reserves the right to inspect precast manhole base sections at the construction site and to reject the use of such sections if the ENGINEER determines the products unsuitable for the ENGINEER'S installation.
 2. Pre-Cast bases shall be used in lieu of doghouse manholes where flow permits, as determined by the ENGINEER.
- C. Cast-in-Place Bases
1. Cast-in-Place Bases shall be used when installing a doghouse manhole over an existing sewer or as approved by the ENGINEER.
 - a. Cast-in-place bases shall be placed on suitable foundations after the pipes are laid as specified in 3.1.A.5.
 2. The base shall be cast monolithically to an elevation at least 12 inches above the top of the highest pipe entering the manhole, except where a drop connection is to be installed.
 - a. Base thickness shall be as per 2.1.B.1.
 - b. Base, walls and bottom shall be at least of the thickness shown and reinforced to withstand the loads to be expected.

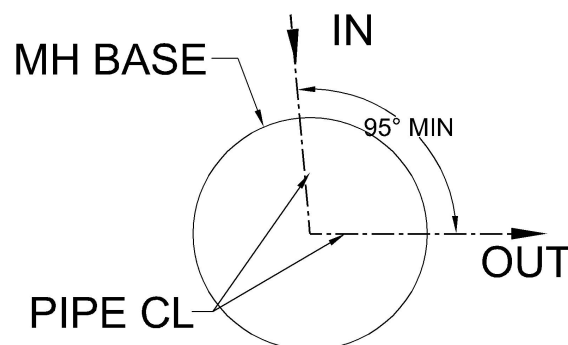
- c. Connections for sewer pipes shall conform to SD1's standard detail.
- d. The base of the bell or groove end at joints between components shall be buttered with 1:2 cement-sand mortar to provide a uniform bearing between components.
- e. All joints shall be sealed with cement mortar inside and out and troweled smooth to the contour of the wall surface.
- f. Raised or rough joint finishes will not be accepted.

3.2 PRECAST MANHOLE SECTIONS

- A. Set sections vertical with steps and sections in true alignment.
- B. Install sections, joints and gaskets in accordance with manufacturer's recommendations.

3.3 MANHOLE CHANNELS

- A. All invert channels through manholes shall be constructed of 4000 psi concrete.
- B. The flow line (channel) and benches shall be cast separately from the floor and side wall at the place of manufacture, unless otherwise approved by SD1.
- C. Channels shall be properly formed to the sizes, cross sections, grades and shapes shown or as ordered.
- D. Benches shall be built up to the heights shown or as ordered and given a uniform wood float finish.
- E. Care shall be taken to slope all benches for proper drainage to the invert channel.
- F. All flow channel angles between any new incoming pipe and new outgoing pipe shall be at least 95 degrees in the direction of flow as seen in the figure below. For any pipe with velocities exceeding 5 ft/s consult SD1 for the required angle or for the need of an oversized manhole.



3.4 GRADE RINGS

- A. Grade rings shall be used for all precast and masonry manholes to adjust height of manhole frame casting where required.
 - 1. Grade rings shall be a maximum of 10 inches in height, constructed on the roof slab or cone section on which the manhole frame and cover shall be placed.
 - 2. The height of the grade ring shall be such as is necessary to bring the manhole frame to the proper grade.
 - 3. One piece precast concrete rings shall be used for grade adjustment greater than six (6) inches and up to ten (10) inches in height. Rings shall be set concentrically on top of the cone section or top slab if used.
 - 4. High density polyethylene risers shall be used for grade adjustment from two (2) inches to a maximum of six (6) inches in height. Rings shall be set concentrically on top of the cone section or top slab if used.
 - 5. All grade rings shall be sealed using two rows of butyl rubber sealant.
- B. The casting frame shall be installed on the riser as previously described with four (4) five-eighths (5/8) inch diameter stainless steel bolts extending through the riser, grade rings, and into the cone section or top slab.
 - 1. The riser and cone may also be drilled with four (4) equally spaced five-eighths (5/8) inch diameter holes and four (4) No. 5 steel reinforcement bars installed and left flush with the riser top to prevent lateral movement and the casting frame bolted to the riser as previously described.
- C. High Density Polyethylene Manhole Adjusting Rings shall be used to adjust up to a maximum of six (6) inches.

3.5 PIPE CONNECTIONS TO MANHOLES

- A. A flexible pipe-to-manhole joint connector shall be used for joining piping to manholes and other miscellaneous structures. The rubber seal shall meet the requirements given in ASTM C 923. The seal shall be of a size specifically designed for the pipe size and material and be as specified herein.
 - 1. If a Kor-N-Seal joint seal or equal with a stainless steel tightening band is used, CONTRACTOR shall tighten the band to the proper torque as specified by the manufacturer.
 - 2. If the slope of the incoming sewer exceeds 26% from the horizontal, a fitting shall be used outside the manhole wall to facilitate a more perpendicular connection to the manhole wall. The use of this fitting is to be evaluated on a case by case basis by ENGINEER.
- B. All pipe connections to manholes shall match crowns. If matching crowns is not possible, a drop manhole may be approved by SD1.
- C. All drop manholes shall be approved by SD1. Drop manholes may be acceptable under the following conditions:
 - 1. If the slope of the influent sewer is greater than or equal to five (5) percent, SD1's drop connection Drawing detail 114 shall be followed. All other influent sewer slopes and drop connections will be evaluated on a case by case basis.
 - 2. All other drop manhole requests shall be approved on a case by case basis including but not limited to pipe realignments, connections to existing manholes, etc.

3.6 CONNECTIONS TO EXISTING MANHOLES

- A. Perform by core drilling in accordance with section 01045.
- B. A flexible pipe-to-manhole joint connector shall be used for joining new piping to existing manholes and other miscellaneous structures. The rubber seal shall meet the requirements given in ASTM C 923. The seal shall be of a size specifically designed for the pipe size and material and be as specified herein.
 - 1. If a Kor-N-Seal joint seal or equal with a stainless steel tightening band is used, CONTRACTOR shall tighten the band to the proper torque as specified by the manufacturer.
- C. The flow channel and bench for the new connection shall be constructed onsite or the existing flow channel and bench modified to accept the new piping.

- D. New connections to existing manholes need to be greater than ninety (90) degrees to the existing flow channel in the direction of the flow.
- E. Where new flows joining an existing eight (8) inch sewer that is flowing half pipe or greater, or the exiting pipe is twelve (12) inches or greater, an oversized manhole shall be installed to allow a smooth, sweeping flow transition. Consult SD1 for required manhole diameter.
- F. Perform all connections in accordance with Parts 3.9 of this Section.

3.7 DOGHOUSE MANHOLES

For joining new pipe to existing pipe, refer to Item 3.1.B.2 of this section for requirements. Doghouse manholes shall only be used for connections to sewer mains with high flows, as determined by the ENGINEER. Doghouse manholes must be approved by SD1. For applications using doghouse manholes, refer to Item 3.1.C of this Section and SD1 Standard Detail No.106 for requirements.

3.8 GRADING AT MANHOLES

- A. Manholes shall be installed to conform to the following convention unless otherwise called for on the Drawings. The ground surface shall be graded to drain away from the manhole. Final dimensions shall be determined after proposed final grading has taken place.
 - 1. Manholes in proposed or existing roads, parking lots, paved areas and lawns shall be installed flush with the surrounding area.
 - 2. Manholes in wooded or other inaccessible areas shall be installed twelve (12) inches above the final grade.
 - 3. Manholes in cultivated fields, hay fields and pastures shall be installed with the cone section flush with the final grade. After installation of the casting, a slope fill 1:5 (1 vertical to 5 horizontal) shall be installed to provide surface drainage away from the manhole.
- B. Manholes in proposed or existing paved areas shall be constructed to meet the final surface grade. In paved areas on State Highways, all manholes shall be 1/2 inch below final wearing surfaces. Manholes shall not project above finished roadway pavements to prevent damage from snowplows.
- C. CONTRACTOR shall be solely responsible for the proper height of all manholes necessary to reach the final grade at all locations. CONTRACTOR is cautioned that ENGINEER'S review of Shop drawings for manhole components will be general in nature and CONTRACTOR shall provide an adequate supply of random length precast manhole riser sections to adjust any manhole to meet field conditions for final grading.

3.9 MANHOLE WATERTIGHTNESS

- A. All manholes shall be free of visible leakage. Each manhole shall be tested for leaks and inspected. If the manhole fails a visual leakage inspection and/or vacuum testing, ENGINEER will consider the manhole defective and the Contractor shall replace the manhole and make any necessary reconnections to the new or existing pipelines at no additional cost to the ENGINEER. No leak repairs shall be performed without the ENGINEER'S approval.
- B. Vacuum test manholes to ASTM C 1244. Testing to be witnessed by ENGINEER. Manholes not subject to vacuum testing must be in writing from ENGINEER. This specification shall govern the negative air pressure (vacuum) testing of sanitary sewer manholes and structures and shall be used as a method of determining acceptability by the ENGINEER, in accepting maintenance of a sanitary sewer manhole or structure on behalf of the public. Other forms of testing of some manholes may be required, as deemed necessary by the ENGINEER.
- C. Manholes shall be tested after installation with all connections in place along with the following completed prior to testing:
 - 1. Lift holes, if any, shall be plugged with an approved, non-shrinkable grout prior to testing.
 - 2. Drop connections shall be installed prior to testing.
 - 3. The vacuum test shall include testing of the seal between the cast iron frame and the concrete cone, slab or grade rings.
 - 4. The manholes shall be backfilled and finished to design grade prior to test.
 - 5. Test pressure requirements of ASTM C-923 shall be met.
- D. Test Procedure:
 - 1. Temporarily plug, with the plugs being braced to prevent the plugs or pipes from being drawn into the manhole, all pipes entering the manhole at least eight inches into the sewer pipe(s). The plug must be inflated at a location past the manhole/pipe gasket.
 - 2. The test head shall be placed inside the frame at the top of the manhole and inflated, in accordance with the manufacturer's recommendations.
 - 3. A vacuum of 10" of mercury shall be drawn on the manhole. Shut the valve on the vacuum line to the manhole and disconnect the vacuum line.
 - 4. The pressure gauge shall be liquid filled, having a 3.5 inch diameter face with a reading from zero to thirty inches of mercury.
 - 5. The manhole shall be considered to pass the vacuum test if it holds at

least 9 inches of mercury for the following time durations:

<u>Manhole Depth</u>	<u>Time (Minutes)</u>		
	<u>4' Diameter</u>	<u>5' Diameter</u>	<u>6' Diameter</u>
20 Feet or Less	1	2	3
20.1 to 30 Feet	2	3	4

Note: Consult SD1 on manhole diameters larger then six (6) feet.

6. If a manhole fails the vacuum test, ENGINEER will consider the manhole defective and the CONTRACTOR shall replace the manhole and/ or defective components and make any necessary reconnections to the new or existing pipelines at no additional cost to the ENGINEER. No repairs shall be made to the manhole unless approved by the ENGINEER.
7. All temporary plugs and braces shall be removed after each test.
8. Manholes will be accepted as having passed the vacuum test requirements if they meet the criteria stated above.

+ + END OF SECTION + +

SECTION 02610

PIPE AND FITTINGS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. CONTRACTOR shall provide all labor, materials, equipment, incidentals, and services as shown, specified, and required for furnishing, installing, and testing all buried piping, fittings, and specials specified herein. Piping herein specified includes force main & gravity sewer. Refer to the pipe material schedule shown below to determine which pipe materials are acceptable for each application. Remove and replace all existing piping that interferes with installation of new pipe or structures or that is damaged by new installations in a manner approved by the ENGINEER.

Type	Size	Depth	Acceptable Materials
Aerial	Any		Ductile Iron; PVC SDR 35 inside casing pipe
Gravity	Any	Less than 20'	PVC SDR 35; Fiberglass Polymer Mortar Pipe SN 46
	Any	20.1' to 30'	PVC SDR 26; Ductile Iron; Fiberglass Polymer Mortar Pipe SN 72
	Any	30.1' or greater	Fiberglass Polymer Mortar Pipe; Ductile Iron
Horizontal Directional Drill	Any	Any	HDPE ; Ductile Iron; Restrained Joint PVC C-900
Force Main	Any	Any	HDPE ;Ductile Iron ; PVC C-900

Depth is based on maximum cover between structures or manhole runs. Pipe shall be the same thickness between structures or manholes.

- B. The Work includes, but is not limited to, the following:
1. Piping beneath structures.
 2. Supports and restraints,.
 3. Pipe encasements.
 4. Work on or affecting existing piping.
 5. Testing.
 6. Cleaning and disinfecting.
 7. Installation of all jointing and gasketing materials, specials, flexible couplings, mechanical couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to complete the buried piping installation.

8. Incorporation of valves, meters and special items shown or specified into the piping systems as required.
 9. Unless otherwise specifically shown, specified, or included under other Sections, all buried piping work required, beginning at the outside face of structures or structure foundations and extending away from structure.
- C. Review installation procedures under other Sections and other contracts and coordinate with the work that is related to this Section.

1.2 RELATED WORK

1. Section 02606 - Manholes.
2. Section 02220, Excavation and Backfill.
3. Section 03300, Cast-In-Place Concrete.

1.3 LIMITATIONS

All existing piping as shown on the Design Drawings is based on the best information available, but ENGINEER makes no guarantees as to the accuracy of the locations or type of piping depicted. All new piping which ties into existing lines must be made compatible with that piping. So that piping conflicts may be avoided, CONTRACTOR shall open up his trench well ahead of the pipe laying operation to confirm exact locations and sizes of existing piping before installing any new piping. CONTRACTOR shall provide all fittings and adapters necessary to complete all connections to existing piping as approved by ENGINEER. All costs associated with alignment adjustments on new piping to tie into existing piping shall be borne by CONTRACTOR. No additional costs will be paid by ENGINEER.

1.4 QUALITY ASSURANCE

Requirements of Regulatory Agencies:

- A. Comply with requirements of UL, FM and other jurisdictional authorities, where applicable.
- B. Refer to the General and Supplementary Conditions regarding permit requirements for this Project.

1.5 REFERENCES

Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

- A. AWWA C104, Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

- B. AWWA C105, Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids
- C. AWWA C110, Standard for Ductile-Iron and Gray-Iron Fittings, 3 In.-48 In. (76 mm-1,219 mm), for Water.
- D. AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
- E. AWWA C115, Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
- F. AWWA C150, Standard for Thickness Design of Ductile-Iron Pipe.
- G. AWWA C151, Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
- H. AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances.
- I. AWWA C606, Grooved and Shouldered Joints.
- J. AWWA C800, Underground Service Line Valves and Fittings.
- K. AWWA C900, Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In.-12 In. (100 mm-300 mm), for Water Dist.
- L. AWWA M23, PVC—Design and Installation
- M. ASTM A 27, Standard Specification for Steel Castings, Carbon, for General Application.
- N. ASTM A 82, Standard Specification for Steel Wire, Plain for Concrete Reinforcement.
- O. ASTM A 185, Welded Steel Wire Fabric for Concrete Reinforcement.
- P. ASTM A 496, Deformed Steel Wire for Concrete Reinforcement.
- Q. ASTM A 497, Steel Welded Wire Fabric, Deformed for Concrete Reinforcement.
- R. ASTM A 1011, Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- S. ASTM A 615, Standard Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- T. ASTM C 14, Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe.

- U. ASTM C 76, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
- V. ASTM C 118, Concrete Pipe for Irrigation or Drainage.
- W. ASTM C 150, Standard Specification for Portland Cement
- X. ASTM C 361, Standard Specification for Reinforced Concrete Low-Head Pressure Pipe.
- Y. ASTM C 443, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
- Z. ASTM C 478, Standard Specification for Precast Reinforced Concrete Manhole Sections.
- AA. ASTM D 1238, Measuring Flow Rates of Thermoplastics by Extrusion Plastometer.
- BB. ASTM D 1598, Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.
- CC. ASTM D 1599, Short Time Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings.
- DD. ASTM D 1784, Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- EE. ASTM D 1785, Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- FF. ASTM D 2122, Determining Dimensions of Thermoplastic Pipe and Fittings
- GG. ASTM D 2412, Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- HH. ASTM D 2464, Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- II. ASTM D 2467, Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- JJ. ASTM D 2564, Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
- KK. ASTM D 2774, Practice for Underground Installation of Thermoplastic Pressure Piping.

- LL. ASTM D 3034, Bell and Spigot-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- MM. ASTM D 3212, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- NN. ASTM D 3261, Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
- OO. ASTM D 3262, Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
- PP. ASTM D 3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- QQ. ASTM D 3754, "Fiberglass" (Glass-Fiber-Reinforced-Thermosetting-Resin) Sewer and Industrial Pressure Pipe.
- RR. ASTM D 4161 Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
- SS. ASTM D 5685, "Fiberglass" (Glass-Fiber-Reinforced-Thermosetting-Resin) Pressure Pipe Fittings.
- TT. ASTM F 437, Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
- UU. ASTM F 439, Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
- VV. ASTM F 441, Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
- WW. ASTM F 493, Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
- XX. ASTM F 714, Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
- YY. ASCE MOP No. 37, Design and Construction of Sanitary and Storm Sewers

1.6 SUBMITTALS

- A. In addition to the requirements of Section 01340, provide the following:
 - 1. Size, class and other details of pipe to be used.
 - 2. Full details of piping, specials, joints, harnessing, and connections to existing piping, structures, equipment and appurtenances.
 - 3. Laying schedules and detailed drawings in plan and profile for piping.

4. Jacking and boring operation details, including size of jacking and receiving pits, method of shoring and dewatering, jacking machine information, casing pipe, spacers and end seals.
 5. Method to monitor vibration, movement, settlement, cracking of nearby structures from jacking and boring operation.
- B. Tests: Submit description of proposed testing methods, procedures and apparatus. Prepare and submit report for each test.
- C. Certificates: Submit certificates of compliance with referenced standards.
- D. As requested by ENGINEER, all pipe manufacturers that supply pipe for the project shall provide a detailed structural design taking in account the depth of burial, highway loads, bedding and backfill requirements, water elevation, soil conditions and installation procedures. All designs submitted shall have a Professional ENGINEER's stamp from Kentucky. Such design shall be received, reviewed, and approved prior to manufacture.
- E. As requested by ENGINEER, pipe manufacturer for each pipe type used shall be present and instruct CONTRACTOR on proper installation technique per shop drawings and manufacturer's recommended procedures. As requested by ENGINEER, pipe manufacturer's representative shall visit job site to monitor progress of pipe installation and shall notify in writing the CONTRACTOR and ENGINEER of any discrepancy, changes, or incorrect procedures that would prevent the pipe from performing as designed.
- F. Record Drawings: Submit record drawings in accordance with Section 01720.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Refer to applicable Sections for material specifications.
- B. General:
1. Marking Piping:
 - a. Clearly mark each piece of pipe or fitting with a designation conforming to those shown on the laying schedule.
 - b. Cast or paint material, type and pressure designation on each piece of pipe or fitting 4 inches in diameter and larger.
 - c. Pipe and fittings smaller than 4 inches in diameter shall be clearly marked by manufacturer as to material, type and rating.

2.2 DUCTILE IRON PIPE AND FITTINGS

- A. Piping furnished hereunder shall be complete with all joint gaskets, bolts, and nuts required for installation of valves and equipment furnished by others for installation

under this contract.

B. Pipe Manufacturer's Experience and Field Services.

1. All ductile iron pipe, fittings, and specials shall be fabricated, lined and coated by the pipe manufacturer. Minimum required experience shall include manufacture of a similar pipeline in length to this contract, of equal or larger diameter than the pipe to be provided with joints, lining, and coating suitable for the same or greater pressure rating specified herein, which has performed satisfactorily for the past 5 years.
2. An experienced, competent, and authorized field service representative shall be provided by the pipe manufacturer to perform all pipe manufacturer's field services specified herein. The field service representative's minimum required experience qualifications shall include 5 years of practical knowledge and experience installing ductile iron pipe with joints, lining, and coating of the pipe to be provided.
3. All ductile iron pipe shall be installed in accordance with the pipe manufacturer's recommendations. The pipe manufacturer's field service representative shall visit the site and inspect, check, instruct, guide, and direct CONTRACTOR's procedures for pipe handling and installation at the start of the pipe installation. The pipe manufacturer's field service representative shall coordinate his services with CONTRACTOR.
4. Each joint, including all restrained joints, shall be checked by CONTRACTOR as instructed by the pipe manufacturer's field service representative to determine that the joint and the restraints are installed properly.
5. The pipe manufacturer's field service representative shall furnish to ENGINEER, a written report certifying that CONTRACTOR's installation personnel have been properly instructed and have demonstrated the proper pipe handling and installation procedures. The pipe manufacturer's field service representative shall also furnish to ENGINEER, a written report of each site visit. The pipe manufacturer's field service representative shall revisit the site as often as necessary until all trouble is corrected and the pipeline installation and operation are satisfactory in the opinion of the ENGINEER.
6. All costs for these services shall be included in the Contract Price.

C. Materials

1. Where ductile iron pipe is required, it shall conform to ANSI/AWWA C151/A21.51, Table 1 or Table 3. Pressure class 350 shall be used for all piping, unless otherwise shown on the drawings or specified. Fittings shall conform to ANSI/AWWA C110/A21.10, or ANSI/AWWA C153/A21.53, with a minimum working pressure rating of 350 psi. All fittings shall be suitable for a test pressure as specified herein without leakage or damage.
2. All buried pressure piping shall be push-on joint or mechanical joint. Restrained joint pipe shall be installed at the station locations shown on the

- Contract Drawings. All above ground piping or piping in vaults shall be flanged.
- 3. All gravity sewer piping shall be push-on joint or mechanical joint.
 - 4. Push-on joints and mechanical joints shall be in accordance with ANSI/AWWA C111/A21.11.
 - 5. Restrained joint pipe shall be fabricated to the lengths required as determined by the laying schedule to be submitted as specified herein. If deviations from the approved laying schedule are required in the field as approved by ENGINEER and field-cuts are required, CONTRACTOR shall provide restraint on the field-cut piping using, EBAA Iron “Megalug” restrained joints as specified below.
 - 6. Field cuts shall be minimized and will be limited to only locations approved by ENGINEER, when no other alternative to using factory provided joint restraint exists. Use of field-lock, fast-grip, field flex-ring, TR-flex gripper ring, etc. gaskets for field-cut pipe shall not be allowed.

D. Joints

- 1. Certification of joint design shall be provided in accordance with ANSI/AWWA C111/A21.11-90, Section 4.5, Performance Requirements, as modified herein.
- 2. The joint test pressure for each type of joint used on this project shall be not less than 2 times the working pressure or 1-1/2 times the test pressure of the pipeline, whichever is higher. The same certification and testing shall also be provided for restrained joints. For restrained joints, the piping shall not be blocked to prevent separation and the joint shall not leak or show evidence of failure.
- 3. It is not necessary that such tests be made on pipe manufactured specifically for this project. Certified reports covering tests made on other pipe of the same size and design as specified herein and on the drawings and manufactured from materials of equivalent type and quality may be accepted as adequate proof of design.
- 4. Nuts, bolts, and tie -rods used on buried pressure pipe and fittings shall be low alloy steel T- bolts with Zinc anode caps for all T-bolts and rods. The entire installation shall be wrapped in two layers of polyethylene encasement. Nuts, bolts and stiffener plates which will be in contact with sewage shall be stainless steel Type 316.

E. Material Schedule

Push-on Joints and Mechanical Joints	ANSI/AWWA C111/A21.11
Restrained Push-on Joints Positive locking segments and/or rings (4 inch through 64 inch)	American “Flex-Ring”, or “Lok-Ring”; U.S. Pipe “TR Flex”; Clow Corp., “Super-Lock”, without exception

Restrained Push-on Joints, (field-cut spigot) locking wedge type	EBAA Iron “Megalug” Series 1700, without exception. Shall only be used in locations approved by the ENGINEER.
Restrained Mechanical Joints (Factory prepared spigot) (4 inch through 48 inch)	American “MJ coupled Joints”
Restrained Mechanical Joints (field cut spigot)	EBAA Iron “Megalug” Series 1100, without exception. Shall only be used in locations approved by the ENGINEER.
Fittings	ANSI/AWWA C110/A21.1, or ANSI/AWWA C153/A21.53, all with minimum working pressure of 350 psi, and suitable for the test pressure based on the project design without leakage or damage.
Flanged Joints & Fittings	Ductile Iron, ANSI/AWWA C115/A21.5 suitable for the test pressure based on the project design without leakage or damage. Faced and drilled, ANSI B16.1 125-pound flat face. Threaded conforming to AWWA C115/A21.15.
Bolting	125-pound flat-faced flange: ASTM A 307, Grade A carbon steel hex head bolts and ASTM A563 Grade A carbon steel hex head nuts
Gaskets	Restrained Push-on and Mechanical Joints: Synthetic rubber conforming to AWWA C111/A21.11. Natural rubber is not acceptable. Flanged: 1/8 inch thick, red rubber (SBR), hardness 80 (Shore A), rated to 200 degrees F., conforming to ANSI B16.21, AWWA C207, and ASTM D1330, Grades 1 and 2. Full face for 125-pound flat-faced flanges, or specially designed gaskets

with required properties per ANSI/AWWA C111/A21.11 to meet the test pressure rating. Blind flanges shall be gasketed covering the entire inside face with the gasket cemented to the blind flange.

Gasket pressure rating to equal or exceed the system hydrostatic test pressure.

Joint Lubricant

Manufacturer’s standard

Polyethylene Encasement

Seamless, ANSI/AWWA C105/A21.5; LLD-8 mil or HDCL-4 mil

- F. Lining and Coating Ductile Iron Pipe and Fittings
1. All buried ductile iron pipe and fittings shall have manufacturers outside standard asphaltic coating and ceramic epoxy lining inside, factory applied. Ceramic epoxy lining shall be Protecto 401 as manufactured by Vulcan Painters, Inc. of Birmingham, AL, or NovoCoat SP-2000W as manufactured by NovoCoat Protective Coatings, of Addison, Texas and as specified herein. Flange faces shall be coated externally with a suitable manufacturer’s standard rust-preventative compound.

2. Application of Lining
The interior of the pipe exposed to liquids and gases shall be blasted and cleaned to remove all loose oxides and rust. After cleaning, the lining material shall be applied to yield 40 mils for the complete system using a centrifugal lance applicator. No lining shall take place over grease, oil, etc., that would be detrimental to the adhesion of the compound to the substrate. The compound shall not be applied when the substrate temperature is below 40 degrees F., or in adverse atmospheric conditions which will cause detrimental blistering, pinholing or porosity of the film.

3. Lining material
The material shall be a two component epoxy with the following minimum Requirements:

a. A permeability rating of 0.0 perms when measured by ASTM E96-66, Procedure A. Duration of test - 6 weeks.

b. A direct impact resistance of 125 inches-pounds with no cracking when measured by ASTM-D-2794.

c. The ability to build at least 50 mils dry in one coat.

d. The material shall be recoatable with itself for at least seven days with no additional surface preparation when exposed to direct summer sun and a temperature of 90 degrees F.

- e. The material shall contain at least 20% by volume of ceramic quartz pigment.
 - f. A test and service history demonstrating the ability of the material to withstand the service expected.
- 4. Inspection
 - a. All pipe shall be checked for thickness using a magnetic film thickness gauge.
 - b. All pipe shall be pinhole detected with a non-destructive 2,500 volt test.
 - c. Each pipe joint shall be marked with the date application of the lining system and with its numerical sequence of application of that date.
 - d. Each requirement of 3. above must be certified by the material supplier.
- 5. Field Cuts
 - a. All manufacturer's procedures and recommendations shall be followed when making field cuts. Note proper field preparations and curing time of the coating.
- G. All items used for jointing pipe shall be furnished with the pipe and tested before shipment. The joints shall be made with tools and lubricant in strict conformity with the manufacturer's instructions. If requested, three (3) copies of such instructions shall be delivered to the ENGINEER at start of construction.
- H. Encasement
 - 1. Polyethylene encasement shall be provided for all buried ductile iron pipe, including all straight pipe, bends, tees, wyes, adapters, closure pieces, field restraint devices, valves and other fittings or specials, in accordance with ANSI/AWWA C105/A21.5, Method A. Preparation of the pipe shall include, but not be limited to: removing lumps of clay, mud, cinders, etc., prior to installation.
 - 2. Where ductile iron pipe is also embedded or encased in concrete or within a casing pipe, the polyethylene encasement shall be installed over the ductile iron pipe prior to concrete placement and in conjunction with installation in the casing pipe.
 - 3. The pipe shall be wrapped with 8-mil thickness polyethylene tube wrap, using the recommended minimum flat tube widths for the specified pipe sizes. The polyethylene tube wrap shall be of virgin polyethylene as produced from DuPont Alathan resin or equal.
 - 4. The polyethylene tube seams and overlaps shall be wrapped and held in place by means of 2-inch wide plastic backed adhesive tape. The tape shall be Polyken Number 900, Scotchrap Number 50, or equal. The tape shall be such that the adhesive shall bond securely to both metal surfaces and polyethylene film.

5. The polyethylene film supplied shall be clearly marked at a minimum of 2-ft along its length, containing the following information:
 - a. Manufacturer's name or trademark
 - b. Year of Manufacture
 - c. ANSI/AWWA C105/A21.5
 - d. Minimum film thickness and material type (LLDPE or HDCLPE)
 - e. Applicable range of nominal pipe diameter size(s)
 - f. Warning--Corrosion Protection--Repair any Damage

2.3 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS (GRAVITY LINES)

A. Polyvinyl Chloride (PVC) and Chlorinated Polyvinyl Chloride (CPVC) Piping – Schedule Rated Pipe:

1. Pipe and Fitting Material:
 - a. Standard: ASTM D 1784.
 - b. Type: Type I, Grade 1, rigid (12454-B).
2. Pipe:
 - a. PVC:
 - 1) Standard: ASTM D 1785.
 - 2) Designation: PVC 1120.
 - b. CPVC:
 - 1) Standard: ASTM F 441.
3. Joints:
 - a. General: Connect pipe by solvent cementing except where flanged or threaded fittings are required at expansion joints, valves, flow meters, equipment connections or otherwise shown or directed.
 - b. Flanged Joints:
 - 1) Use flanges joined to pipe by solvent cementing.
 - 2) Flange Drilling and Dimensions: Comply with ANSI B16.1.
 - 3) Flange Gaskets: Viton full face.
 - 4) Bolts, Nuts and Washers: Type 316 stainless steel.
 - 5) Provide washers on each face of the bolted connection.
 - c. Threaded Joints:
 - 1) Taper Pipe Threads: ANSI B2.1.
 - 2) Joint Preparation: Teflon tape.
 - 3) Use PVC dies for taper pipe threads.
 - d. Primer and Solvent Cement:
 - 1) Standard:
 - a) PVC: ASTM D 2564.
 - b) CPVC: ASTM F 493.
4. Fittings:
 - a. Socket-Type:
 - 1) PVC:
 - a) Standard: ASTM D 2467.
 - b) Designation: PVC I.
 - 2) CPVC:
 - a) Standard: ASTM F 439.
 - b. Threaded Type:
 - 1) PVC:

- a) Standard: ASTM D 2464.
 - b) Designation: PVC I.
 - 2) CPVC:
 - a) Standard: ASTM F 437.
- B. Polyvinyl Chloride (PVC) Piping – Gravity Sewer Pipe and Fittings:
 - 1. Pipe and Fitting Material:
 - a. Standard: ASTM D 1784.
 - 2. Pipe and Fittings:
 - a. Standard:
 - 1) 4-inch through 15-inch diameter: ASTM D 3034.
 - 2) 18-inch through 27-inch diameter: ASTM F 679.
 - b. Thickness Class: As shown in item 1.1 this section.
 - 3. Joints:
 - a. Push On Joints: Connect pipe with integral wall bell and spigot joints. The bell shall consist of an integral wall section with a solid cross section rubber gasket, factory assembled, securely locked in place to prevent displacement during assembly. Joints shall be assembled in accordance with the pipe manufacturer's recommendations and ASTM D 3212.
 - b. Gaskets: Rubber gaskets shall be in compliance with ASTM F 477 and shall be suitable for the service specified.

2.4 TRACER WIRE

- A. All pressure pipe shall have marking tape 6" wide. Marking tape for the force main shall be green with the words "Sanitary Sewer" installed approximately twelve (12) inches above the pipe and shall continue for the length of the pipe installation.
- B. All pipe for sanitary force mains shall be installed with a twelve (12) gauge solid copper (PVC coated) tracing wire taped to the top of the pipe every five (5) feet. No tracing wire length shall exceed fifteen hundred (1500) feet between air release valves and/or discharge manhole, where system becomes gravity, without terminating in a curb stop box marked with "Sewer". Tracing wire must run continuously through air release valves and made accessible from ground level. Sanitary force mains that end in a discharge manhole, at which point system becomes gravity, shall terminate tracing wire in a curb stop box next to the discharge manhole. Curb stop boxes shall not be located in pavement areas. Splices in the tracing wire shall be kept to a minimum and approved by ENGINEER. If splices are required, they shall be made with copper split bolt (IlSCO #1K-8 or approved equal) and taped with electrical tape. Tracer wire shall be tested to confirm it is functioning properly after installation.

2.5 PIPE COUPLINGS

- A. The pipe couplings shall be of a gasketed, sleeve-type with diameter to properly fit the pipe. Each coupling shall consist of one (1) stainless steel middle ring, of

thickness and length specified, two (2) stainless steel followers, two (2) rubber-compounded wedge section gaskets and sufficient track-head steel bolts to properly compress the gaskets. The couplings shall be assembled on the job in a manner to insure permanently tight joints under all reasonable conditions of expansion, contraction, shifting and settlement, unavoidable variations in trench gradient, etc. The coupling shall be Dresser, Style 38, as manufactured by Dresser Manufacturing Division, Bradford, PA, or equal.

2.6 JOINT RESTRAINERS AND APPURTENANCES

- A. General: Where new pipe is connected to the existing piping, consult ENGINEER for appropriate pipe connections.

PART 3 - EXECUTION

3.1 GENERAL

- A. After being delivered alongside the trench, the pipe, fittings, and specials shall be carefully examined for cracks, soundness, or damage, or other defects while suspended above the trench before installation. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. Before each piece of pipe is lowered into the trench, it shall be thoroughly cleaned out. Each piece of pipe shall be lowered safely and separately in the trench. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.
- B. The bell and spigot of the joint shall be thoroughly wire brushed and cleaned of dirt and foreign matter immediately prior to jointing. The contact surfaces shall be coated with the lubricant, primer or adhesive recommended by the manufacturer, and then the pipe shall be pushed together until the joint snaps distinctly in place. The pushing together of the pipe may be done by hand or by the use of a bar.
- C. Place pipe to the grades and alignment indicated, with a tolerance of one in 100 vertical and one in 500 horizontal, unless otherwise directed by the ENGINEER. Remove and relay pipes that are not laid correctly. Slope piping uniformly between elevations shown.
- D. Trenches shall be kept dry during pipe laying. Before pipe laying is started, all water that may have collected in the trench shall be removed. Ensure that ground water level in trench is at least 12 inches below bottom of pipe before laying piping. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete and protect and keep clean water pipe interiors, fittings and valves.

- E. All pipe shall be laid starting at the lowest point and proceed towards the higher elevations, unless otherwise approved by ENGINEER. Place bell and spigot pipe so that bells face the direction of laying, unless otherwise approved by ENGINEER.
- F. When laying of the pipe is stopped, the end of the pipe shall be securely plugged or capped. Plugging shall prevent the entry of animals, liquids, or persons into the pipe or the entrance or insertion of deleterious material.
 - 1. Install standard plugs into all bells at dead ends, tees or crosses. Cap all spigot ends.
 - 2. Fully secure and block all plugs and caps installed for pressure testing to withstand the specified test pressure.
 - 3. Where plugging is required for phasing of the Work or for subsequent connection of piping, install watertight, permanent type plugs.
- F. Pipe manufacturer for each pipe type used shall be present and instruct CONTRACTOR on proper installation technique per shop drawings and manufacturer's recommended procedures prior to the start of the Work.
- G. Install piping as shown, specified and as recommended by the manufacturer. If there is a conflict between manufacturer's recommendations and the Drawings or Specifications, request instructions from ENGINEER before proceeding.
- H. Deflections at joints shall not exceed 75 percent of the amount allowed by the pipe manufacturer.
- I. Field cut pipe, where required, with a machine specially designed for cutting piping. Make cuts carefully, without damage to pipe or lining, and with a smooth end at right angles to the axis of pipe. Cut ends on push-on joint shall be tapered and sharp edges filed off smooth. Flame cutting will not be allowed.
- J. Touch up protective coatings in a satisfactory manner prior to backfilling. See pipe material section for specific requirements.
- K. Place concrete pipe containing elliptical reinforcement with the minor axis of the reinforcement in a vertical position.
- L. Laying Pipe and Service Laterals
 - 1. Conform to manufacturer's instructions and requirements of the standards listed below, where applicable:
 - a. Ductile Iron Pipe: AWWA C600, AWWA C105.
 - b. Concrete Pipe: AWWA M9, Concrete Pipe Handbook.
 - c. Thermoplastic Pipe: ASTM D 2774.
 - d. ASCE Manual of Practice No. 37.

3.2 PIPING INSTALLATION- GENERAL

- A. Excavation for Pipeline Trenches: Refer to Section 02220. Trenches in which pipes are to be laid shall be excavated to the depths shown on the Drawings or as specified by the ENGINEER. Minimum cover for all pipelines shall be 36 inches under non-traffic areas and 60 inches under traffic areas unless otherwise shown on the Drawings or approved by the ENGINEER. All trench excavations shall be inspected by ENGINEER prior to laying pipe. Notify ENGINEER in advance of excavating, bedding and pipe laying operations.
- B. Jointing: The types of joints described herein shall be made in accordance with the manufacturer's recommendations.
- C. Separation of Sewers and Potable Water Pipe Lines:
 - 1. Horizontal and Vertical Separation:
 - a. Wherever possible, existing and proposed potable water mains and service lines, and sanitary and storm sewers and service lines shall be separated horizontally by a clear distance of not less than 10 feet.
 - b. If local conditions preclude a clear horizontal separation of not less than 10 feet, the installation will be permitted provided the potable water main is in a separate trench or on an undistributed earth shelf located on one side of the sewer and at an elevation so the bottom of the potable water main is at least 18 inches above the top of the sewer.
 - c. Exception:
 - 1) Where it is not possible to provide the minimum horizontal and vertical separation described above, the potable water main must be constructed of cement lined ductile iron slip-on or mechanical joint pipe complying with the public water supply design standards of the governing agency. Sewer must be constructed of epoxy lined ductile iron slip-on or mechanical joint pipe complying with SD1's requirements. Both pipes shall be pressure tested in accordance with the requirements of the buried piping schedule, but in no case less than 150 psi, to assure watertightness before backfilling.
 - 2. Crossings:
 - a. Provide a minimum vertical distance of 18 inches between the outsides of pipes.
 - b. Center one full length section of potable water main over the sewer so that the sewer joints will be equidistant from the potable water main joints.
 - c. Provide adequate structural support where a potable water main crosses under a sewer to maintain line and grade.
 - d. Exceptions:
 - 1) See requirements in paragraph 3.2.C.1.c.(1) above.

- 2) Encase either potable water main or sewer in a watertight carrier pipe that extends 10 feet on both sides of the crossing, measured perpendicular to the potable water main.

D. Piping in close proximity to cathodic protection:

1. Where new metal piping is in close proximity to or crosses existing steel or Ductile Iron pipe confirmation if the existing piping has cathodic protection shall be performed. If existing piping is catholically protected, ENGINEER shall be consulted for direction.

E. On steep slopes, take measures acceptable to ENGINEER to prevent movement of the pipe during installation. Permanent slope anchors shall be installed on all pipe with slopes over twenty (20) percent. See the SD1's standard detail for Concrete Anchor Block. Sewer on twenty percent (20%) slopes or greater shall be anchored securely with concrete anchors or equal, spaced as follows;

- 1) Not Over thirty-six (36) feet center to center on grades twenty percent (20%) and up to thirty-five percent (35%)
- 2) Not Over twenty-four (24) feet center to center on grades thirty-five percent (35%) and up to fifty percent (50%)
- 3) Not Over sixteen (16) feet center to center on grades fifty percent (50%) and over.
- 4) Confirm with ENGINEER on spacing of the anchors.

F. Dewatering and Ground Water

1. Discharging of sediment laden groundwater or rainwater from excavations directly to watercourses or storm sewers is prohibited. Failure of the CONTRACTOR to comply with the requirements of this specification may result in ENGINEER issuing a stop work order or non-approval of pay estimates until the CONTRACTOR puts measures in place to comply with this specification. All costs associated with the stop work or non-approval of pay estimates shall be at the CONTRACTOR's sole expense.
2. Pipe trenches and excavations for appurtenances shall be kept free from water during trench bottom preparation, pipe laying and jointing, pipe embedment and building of appurtenances in an adequate and acceptable manner.
3. Where the trench or excavation bottom is mucky or otherwise unstable because of ground water, or where the ground water elevation is above the bottom of the trench or excavation, the ground water shall be lowered by means acceptable to the ENGINEER to the extent necessary to keep the trench or excavation free from water while the trench or excavation is in progress. The discharge of ground water from the trench or excavation

area shall be by the methods specified below to natural drainage channels, gutters, drains, or storm sewers which will conduct the water away from the trench or excavation area. Means of diverting any surface water away from the trench or excavation area shall be taken and surface water prevented from entering the trench or excavation area.

4. Dewatering equipment shall be provided to remove and dispose of all surface water and groundwater entering excavations, trenches, or other parts of the work. Each excavation shall be kept dry during sub grade preparation and continually thereafter until the structure to be built, or the pipe to be installed therein, is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result.
5. All excavations for concrete structures or trenches which extend down to or below groundwater shall be dewatered by lowering and keeping the groundwater level beneath such excavations a minimum of 6 inches or more below the bottom of the excavation.
6. Surface water shall be diverted or otherwise prevented from entering excavations or trenches to the greatest extent possible without causing damage to adjacent property.
7. Groundwater and rainwater removed during dewatering shall be discharged onto undisturbed ground where vegetative cover exists or through sediment and erosion controls and allowed to flow overland to filter out any sediments before discharging to any drain, storm sewer, or watercourse specified above. No such flows are permitted onto exposed soils, stream banks, or other areas subject to erosion.
8. Where overland flow on existing undisturbed ground is not sufficient to adequately remove all sediment from dewatering operations prior to discharge to any drain, storm sewer, or watercourse, straw bale check dams, sediment capturing bags, or other means acceptable to ENGINEER or ENGINEER shall be used to remove the sediment from the water prior to discharge. The method of discharging ground water or rain water from the trench or excavation area shall be such as to not create any erosion of existing ground.
9. All discharge locations shall be approved prior to construction by the ENGINEER.
10. CONTRACTOR shall take measures to prevent damage to properties, structures, sewers, and other utility installations and other work.
11. CONTRACTOR shall repair all damage, disruption, or interference resulting directly or indirectly from groundwater control system operations

at no additional cost to ENGINEER.

12. The CONTRACTOR shall maintain the components of the dewatering system and surface water erosion and sediment controls within the project site. Deficiencies identified during visual inspection by ENGINEER, ENGINEER 's representatives, or the governing regulatory authority shall be remedied by the CONTRACTOR at no additional cost to ENGINEER.
13. Dewatering system components shall be located where they will not interfere with construction activities adjacent to the work area.
14. The CONTRACTOR shall be responsible for the condition of any pipe or conduit which he may use for drainage purposes, and all such pipe or conduit shall be left clean and free of sediment.

G PIPE ENCASEMENTS

1. Concrete Encasement
 - a. Wherever pipe encasement is called for on the plans or ordered in by ENGINEER, the CONTRACTOR shall construct the encasement as shown on the drawings or in accordance with SD1's standard drawings.
 - b. Support the pipe sections on oak blocks or other compressible blocks, being sure to keep the pipe sections on line and grade and then pour concrete, completely under each section, along each side and up to a point at least twelve (12) inches above the top of each section, making sure that all voids are filled. In lieu of blocks, the CONTRACTOR may use a bed of concrete, to initially support the pipe sections.
 - c. The minimum dimension of concrete under the pipe sections shall be six (6) inches and on each side of the sections shall be twelve (12) inches. This encasement shall be reinforced around the top and sides of the pipe as shown on the Contract Drawings for creek crossings and other locations. If the trench walls are nearly vertical from the bottom of the trench up to a point to which the encasement is to be poured, forms for forming the encasement may be omitted and the concrete poured to and against the trench walls. Where trench walls are not nearly vertical, proper forms shall be set for forming the encasement, unless otherwise called for by ENGINEER. The space between the trench walls and any formed encasement shall be filled and compacted with approved pipe bedding or backfilling material.
 - d. Care shall be taken to assure that the pipe sections remain on line and grade during the placing of concrete and that the joints are not disturbed. Backfill shall not be placed for a minimum of six (6) hours after encasement is completed, unless otherwise approved by ENGINEER.
 - e. Exercise care to avoid flotation when installing pipe in cast-in-place

concrete.

2. Casing Pipe

- a. Whenever casing pipe is called for on the plans, the CONTRACTOR shall install a casing pipe of the size and of the material called for on the plans by means of jacking, boring, or trenching.
- b. When the casing pipe is to be installed under a highway or railroad, and at other locations specifically designated on the Drawings, the method of installation shall be jacking or boring as specified in Section 02400, unless trenching is specifically allowed.
 1. For force mains inside casing pipe all pipe joints shall be restrained joint connections. Casing spacers or wood blocking shall be used to center the pipe in the casing. The annular space between the force main and casing pipe shall be completely filled with 500 psi or higher compressive strength grout.
 2. For gravity pipe inside casing pipe, casing spacers shall be used to center the pipe within the casing. The annular space does not have to be filled.
- c. Casing Spacers- Include in casing pipe. Centered/Restrained Casing spacers shall be installed to position the carrier pipe within the center of the casing pipe. The required spacing and installation shall be per the manufacturer's recommendation, except that for PVC carrier pipe, a minimum of 3 spacers shall be installed on each length of pipe with a maximum 6 feet spacing between spacers. All spacers shall be 316 stainless steel as manufactured by Cascade Waterworks MFG Co., Advance Products and Systems (APS) or other approved equal. Casing spacers shall also be provided with height field-adjustment capability for installation of gravity sewer on a constant slope.
- d. Casing pipe end seals shall be installed at each end of the casing pipe and shall consist of a proper sized rubber seal and attached to the carrier and casing pipe with stainless steel bands per the manufacturers recommendation. Casing pipe end seals shall be manufactured by Cascade Waterworks MFG Co., Advanced Products and Systems (APS) or other approved equal.

H Work Affecting Existing Piping

1. Location of Existing Piping:
 - a. Locations of existing piping shown should be considered approximate.
 - b. CONTRACTOR shall determine the true location of existing piping to which connections are to be made, and location of other facilities which could be disturbed during earthwork operations, or which may be affected by CONTRACTOR'S Work in any way.

- c. Conform to applicable requirements of Division 1 pertaining to cutting and patching, and connections to existing facilities.
- 2. Taking Existing Pipelines Out of Service:
 - a. Do not take pipelines out of service unless specifically noted on the Drawings, or approved by ENGINEER.
- 3. Work on Existing Pipelines:
 - a. Cut or tap pipes as shown or required with machines specifically designed for this work.
 - b. Install temporary plugs to prevent entry of mud, dirt, water and debris.
 - c. Provide all necessary adapters, fittings, pipe and appurtenances required to complete the Work.
- I. Install service laterals per SD1's standard details and per the requirements specified in this specification,.
- J. Bedding and backfilling of pipeline trenches shall be in accordance with the requirements set forth in Section 02220 and as shown on SD1's trench compaction detail.
- K. Before final acceptance, the CONTRACTOR will be required to level all trenches or to bring the trench up to grade. The CONTRACTOR shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction.

3.3 DUCTILE IRON PIPE INSTALLATION REQUIREMENTS

- A. Jointing Pipe:
 - 1. Ductile Iron Mechanical Joint Pipe:
 - a. Wipe clean the socket, plain end and adjacent areas immediately before making joint. Make certain that cut ends are tapered and sharp edges are filed off smooth.
 - b. Lubricate the plain ends and gasket with soapy water or an approved pipe lubricant, in accordance with AWWA C111, just prior to slipping the gasket onto the plain end of the joint assembly.
 - c. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end.
 - d. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.
 - e. Push gland toward socket and center it around pipe with the gland lip against the gasket.
 - f. Insert bolts and hand tighten nuts.
 - g. Make deflection after joint assembly, if required, but prior to tightening bolts. Alternately tighten bolts 180 degrees apart to seat the gasket evenly. The bolt torque shall be as follows:

<u>Pipe Size (inches)</u>	<u>Bolt Size (inches)</u>	<u>Range of Torque (ft-lbs)</u>
3	5/8	45-60
4-24	3/4	75-90
30-36	1	100-120
42-48	1-1/4	120-150

2. Ductile Iron Push-On Joint Pipe:
- a. Prior to assembling the joints, the last 8 inches of the exterior surface of the spigot and the interior surface of the bell shall be thoroughly cleaned and all mud, debris, etc. removed and joint recesses wiped clean.

b. Rubber gaskets shall be wiped clean and flexed until resilient. Refer to manufacturer's instructions for procedures to ensure gasket resiliency when assembling joints in cold weather.

c. Insert gasket into joint recess and smooth out the entire circumference of the gasket to remove bulges and to prevent interference with the proper entry of the spigot of the entering pipe.

d. Immediately prior to joint assembly, apply a thin film of approved lubricant to the surface of the gasket which will come in contact with the entering spigot end of pipe. CONTRACTOR may, at his option, apply a thin film of lubricant to the outside of the spigot of the entering pipe.

e. For assembly, center spigot in the pipe bell and push pipe forward until it just makes contact with the rubber gasket. After gasket is compressed and before pipe is pushed or pulled all the way home, carefully check the gasket for proper position around the full circumference of the joint. Final assembly shall be made by forcing the spigot end of the entering pipe past the rubber gasket until it makes contact with the base of the bell. When more than a reasonable amount of force is required to assemble the joint, the spigot end of the pipe shall be removed to verify the proper positioning of the rubber gasket. Gaskets which have been scoured or otherwise damaged shall not be used.

f. Maintain an adequate supply of gaskets and joint lubricant at the site at all times when pipe jointing operations are in progress.
3. Proprietary Joints:
- a. Pipe which utilizes proprietary joints such as Fastite, by American Cast Iron Pipe Company, Tyton by U.S. Pipe Incorporated, restrained joints, or other such joints shall be installed in strict accordance with the manufacturer's instructions.

- B. Polyethylene Tube Wrap Installation
- The polyethylene tube wrap shall be installed on ductile iron pipe in accordance with AWWA C105 and the following:
1. Pick up the pipe by a crane at the side of the trench using either a sling or pipe tongs, and raise the pipe about three feet off the ground. Slip a section

of the polyethylene tubing over the spigot end of the pipe and bunch up, accordion fashion, between the end of the pipe and the sling. The tubing should be cut to a length approximately 4 feet longer than the length of the pipe.

2. Lower the pipe into the trench, seat the spigot end in the bell of the adjacent installed pipe and then lower the pipe to the trench bottom. A shallow bell hole shall be provided in the trench bottom to facilitate the wrapping of the joint.
3. Make up the pipe joint in the normal fashion.
4. Remove the sling from the center of the pipe and hook into the bell cavity and raise the bell end 3 or 4 inches to permit the polyethylene tubing to be slipped along the full length of the barrel. Enough of the tubing should be left bunched up, accordion fashion, at each end of the pipe to overlap the adjoining pipe approximately 2 feet.
5. To make the overlap joint, pull the tubing over the bell of the pipe, fold around the adjacent spigot and wrap with approximately three (3) circumferential turns of the 2-inch wide plastic adhesive tape to seal the tubing to the pipe.
6. The tubing on the adjacent pipe shall then be pulled over the first wrap on the pipe bell and sealed in place behind the bell using approximately three circumferential turns of the 2-inch plastic adhesive tape.
7. The resulting wrap on the barrel of the pipe will be loose, and it should be pulled snugly around the barrel of the pipe and the excess material folded over at the top, and held in place by means of 6-inch strips of the 2-inch wide plastic adhesive tape at intervals of approximately 3 feet along the pipe barrel.
8. Fittings, valves, hydrants, etc., shall be hand wrapped, using polyethylene film that is held in place with the plastic adhesive tape.
 - a. Bends, reducers, and offsets can be wrapped with the polyethylene tubing in the same manner as pipe.
 - b. Valves can be wrapped by bringing the tube wrap on the adjacent pipe over the bells or flanges of the valve and sealing with a flat sheet of the polyethylene passed under the valve bottom and brought up around the body to the stem and fastened in place with the adhesive tape.
 - c. Hydrants can be wrapped with polyethylene tubing slipped over the hydrant to encase the hydrant from the lead-in valve to the ground level of the hydrant. To provide drainage of the hydrant, it is necessary to cut a small hole in the film and insert a short pipe nipple to drain the water to the soil outside the film wrap.
 - d. All fittings that require concrete backing should be completely wrapped prior to pouring the concrete backing block.

3.4 POLYVINYL CHLORIDE (PVC) GRAVITY PIPE INSTALLATION REQUIREMENTS

A. Push-on Joints

1. Bevel all field-cut pipe, remove all burrs and provide a reference mark the correct distance from the pipe end.
2. Clean the pipe end and the bell thoroughly before making the joint. Insert the O-ring gasket, making certain it is properly oriented. Lubricate the spigot well with an approved lubricant; do not lubricate the bell or O-ring. Insert the spigot end of the pipe carefully into the bell until the reference mark on the spigot is flush with the bell.

3.5 GENERAL TESTING REQUIREMENTS

A. General:

1. Test all piping.
2. All piping shall be tested prior to post-construction CCTV operations.
3. Notify ENGINEER at least 48 hours in advance of testing.
4. Conduct all tests in the presence of ENGINEER.
5. Remove or protect any pipeline-mounted devices which may be damaged by the test pressure.
6. Provide all apparatus and services required for testing, including but not limited to, the following:
 - a. Test pumps, bypass pumps, hoses, calibrated gauges, meters, test containers, valves and fittings.
 - b. Temporary bulkheads, bracing, blocking and thrust restraints.
7. Provide air if an air test is required and power if pumping is required.
8. CONTRACTOR shall provide fluid required for testing.

B. Displacement of Pipe

1. The sewer pipe sections may be checked by ENGINEER to determine if any displacement of the pipe sections from alignment and grade have occurred as each portion of the sewer is completed between manhole locations. When the test is required by ENGINEER, it shall be as follows:
 - a. Flashing a light beam by means of a strong flashlight or reflecting sunlight through the portion of the sewer between manhole locations or by utilizing a laser beam.
 - b. When viewed from the opposite end of the portion of the sewer from the light location, the light beam should be full throughout the sections, but not less than two-thirds full under any circumstances. There shall be no "dips" in the grade of the pipe invert.
 - c. If the pipe sections show any misalignment, displacement or any other defects in the sections or joints, the CONTRACTOR shall remedy the defect to the satisfaction of ENGINEER.
 - d. This test may be done after the pipe sections have been laid, the joints completed and the bedding completed to twelve (12) inches above the pipe sections, or after completion of the sewer and all backfilling has been undertaken or both.

C. Deflection of Pipe

1. A deflection test shall be performed on all gravity sanitary sewers using flexible pipe. The test shall be conducted after the final backfill has been in place at least thirty (30) days. No pipe shall exceed a deflection of five percent (5%). The deflection test is to be run by using a rigid mandrel, or equal means approved by ENGINEER, and shall have a diameter equal to ninety-five percent (95%) of the inside diameter of the pipe, including the pipe manufacturer's tolerances. The test shall be performed without mechanical pulling devices. All tests must be witnessed and approved by a representative of ENGINEER.
2. A deflection test shall be performed on all ductile iron gravity sanitary sewers exceeding twelve (12) feet in depth. The test shall be conducted after the final backfill has been in place at least thirty (30) days. No pipe shall exceed a deflection of five percent (5%). The deflection test is to be run by using a rigid fin style mandrel fitted with rubber inline skate wheels, rubber padding on the fins, or equal means to prevent damage to the internal lining of the pipe. If a wheeled mandrel is used each fin shall have 2 wheels made of polyurethane with a Shore Scale durometer value of between 78A and 82A. Any damages to the lining from the mandrel testing shall be repaired to the satisfaction of ENGINEER at the sole expense of the CONTRACTOR. Final diameter of the protected mandrel shall be equal to ninety-five percent (95%) of the inside diameter of the pipe, including the pipe manufacturers' tolerances. The test shall be performed without mechanical pulling devices. All tests must be witnessed and approved by a representative of ENGINEER.

D. Air Test for Gravity Sewers 42" and Smaller

1. The CONTRACTOR shall test the tightness of the pipe sections, joints and appurtenances of all gravity sewers by means of the low pressure air test.
2. No tests shall be made until the backfill is consolidated over the pipe and all service lines in the section to be tested have been connected and plugged.
3. The low pressure air test shall be conducted in accordance with procedures outlined in UNIBELL Specification UNI B-6. If the section of sewer being tested is below the elevation of ground water in the trench, the test pressure shall be 0.433 psi for each foot of ground water above the invert of the pipe.
4. All tests must be witnessed and approved by a representative of ENGINEER.
5. Any leaks determined from the air test shall be replaced by the CONTRACTOR to the satisfaction of ENGINEER.
6. The minimum air test pressure for all gravity sewers shall be 7 psi.

E. Repair of Failed Pipe Sections:

1. Contact ENGINEER 24 hours prior to making any repairs to failed pipe sections. ENGINEER shall be present during the entire duration of time repairs are being made to failed sections of pipe.

2. The CONTRACTOR shall remove and replace, at no extra cost to ENGINEER all sections of pipe which fail any of the tests specified in this section in accordance with the following procedures:
 - a. Excavate failed sections of pipe in accordance with Section 02220.
 - b. Cut out and/or remove failed sections and relay new pipe beginning at nearest joint.
 - c. Close pipe with pipe coupling per manufacturer's recommendation and approval of ENGINEER.
3. The CONTRACTOR shall provide all material, labor, and equipment necessary to remove and replace the failed pipe section.
4. Retest the replaced sewer sections to meet the requirements listed in this section.

3.6 CLEANING

- A. Cleaning:
1. Thoroughly clean all piping and flush in a manner approved by ENGINEER, prior to placing in service.
 2. Piping 24 inches in diameter and larger shall be inspected from inside and all debris, dirt and foreign matter removed.
 3. If piping which requires disinfection has not been kept clean during storage or installation, CONTRACTOR shall swab each section individually before installation with a five percent hypochlorite solution, to ensure clean piping.

3.7 CLEAN-UP

Upon completion of the installation of the piping and appurtenances, the CONTRACTOR shall remove all debris and surplus construction materials resulting from the work. The CONTRACTOR shall grade the ground along each side of pipe trenches in a uniform and neat manner leaving the construction area in a shape as near as possible to the original ground line.

- END OF SECTION -

SECTION 02651

TELEVISION INSPECTION

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope: CONTRACTOR shall provide all labor, materials, tools, equipment and incidentals as shown, specified, and required to perform Post- Installation television (TV) inspection of all sanitary sewers, as specified herein.

1.2 DEFINITIONS

- A. Post-Installation TV Inspection: Video inspection to determine that rehabilitation of an existing sewer or construction of new sanitary sewers have been completed according to Specifications.

1.3 PERFORMANCE REQUIREMENTS

- A. Inspection shall be done one sewer line section (i.e. manhole to manhole) at a time.
- B. Quality of inspection recording shall be acceptable to ENGINEER when viewed on a 19" monitor.
- C. Inspection shall be performed by a SCREAM™ or NASSCO *Pipeline Assessment Certification Program* (PACP) certified operator and shall meet the coding and reporting standards and guidelines as set by SCREAM™ or PACP. All report annotations, pipe conditions and pipe defects shall be identified properly using SCREAM™ or PACP codes as defined by SCREAM™ or NASSCO.

1.4 SUBMITTALS

- A. Submit one copy of Electronic Inspection Reports and TV videos on portable hard drive, CD, DVD, or other digital media.

1.5 REFERENCE STANDARDS

- A. NASSCO prepared *Pipeline Assessment and Certification Program* (PACP), Current Edition Reference Manual. This manual includes a standard TV inspection form and sewer condition codes.

PART 2 – PRODUCTS

2.1 TELEVISION EQUIPMENT

- A. Closed Circuit TV Equipment: Select and use closed-circuit television equipment that will produce a color digital recording.
- B. Pipe Inspection Camera: Produce a video using a pan-and-tilt, radial viewing, pipe inspection camera or a hand-held video camera that pans \pm 275 degrees and rotates 360 degrees. Use an accurate footage counter to measure the exact distance of the camera from the centerline of the starting point. Use a camera with camera height adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe being televised. Provide a lighting system that allows the features and condition of the pipe to be clearly seen. A reflector in front of the camera may be required to enhance lighting in humidity conditions. The camera shall be operative in 100 percent humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution colored video picture. Picture quality and definition shall be to the satisfaction of the ENGINEER. If unsatisfactory, equipment shall be removed and no payment made for an unsatisfactory inspection.
- C. Television Inspection Logs: Prepare printed location records to clearly identify the location of each source of infiltration or defect discovered using a standard stationing system. Other data of significance includes:
 - 1. Estimation of extraneous flows observed from holes, joints, cracks, and from the annular space between rehabilitated sliplined pipe.
 - 2. Unusual conditions.
 - 3. Roots.
 - 4. Cracked or collapsed sections.
 - 5. Sags or low spots in the pipe.
 - 6. Presence of scale and corrosion.
 - 7. Structural deficiencies.
 - 8. Signs of previous leakage.
 - 9. Sewer line sections that the camera failed to pass through and reasons for the failure.
 - 10. Other discernible features.
- D. For off-road work, CONTRACTOR shall provide the appropriate vehicle(s) for the terrain in order to access the sewers and allow for proper inspection of the sewers and manholes.
- E. Data shall be recorded digitally and a copy of the television inspection logs shall be supplied to the ENGINEER in the form of a bound report. A

table listing acronyms and their meaning shall be included in the report. CONTRACTOR shall also supply the ENGINEER a copy of the television inspection logs on an electronic file that is Microsoft Excel compatible.

- F. Video Capture - Full time live color video files shall be captured for each pipe segment inspected. The files shall be stored in industry standard MPEG format viewable from an external hard drive on an external personal computer that utilizes a standard digital media player to view the recording. The MPEG video shall be ISO-MPEG Level 1 (MPEG-1) coding with a resolution of at least 352 pixels (x) by 240 pixels (y) and an encoded frame rate of 29.97 frames per second. System shall perform an automatic disk image/file naming structure to allow saved video/data sections to be saved to a portable hard drive. The video recording shall be free of electrical interference and shall produce a clear and stable image. The digital recordings and inspection data shall be cross-referenced to allow instant access to any point of interest within the digital recording.

PART 3 – EXECUTION

3.1 POST INSTALLATION TELEVISION INSPECTION

- A. All newly constructed sewer shall be cleaned and free from debris prior to performing the post installation television inspection. This cost shall be considered incidental to the post installation television inspection.
- B. Televises each sewer line to document the structural and maintenance conditions of the line. The sewer inspections shall be compatible with the SCREAM™ defect coding system for sewers and manholes, which is SD1's standard defect coding system. The CONTRACTOR shall either use the SCREAM™ sewer defect coding system unless ENGINEER will allow the CONTRACTOR to use an industry standard defect coding system, such as NASSCO PACP in lieu of using the SCREAM™ sewer defect codes, to conduct the sewer inspections.
1. The following data for the defect observations shall be recorded:
- Observation Data
 - Observation#, unique per defect
 - Footage
 - Clock position (1 – 12)
 - Defect/Description (use code)
 - Comments
- C. In addition to recording the defects for the sewers and manholes, CONTRACTOR shall also record the following attribute data as “fields” in their inspections:
- Upstream MH#
 - Downstream MH#

- Date of inspection
 - Direction of inspection
 - 1 = upstream to downstream
 - 2 = downstream to upstream
 - Length of pipe (as noted by last observation footage)
 - Diameter/height (inches)
 - Shape (use shape code or text)
 - Material (use pipe material code or text)
 - Pipe width, non-circular (inches)
 - Crew
 - Video (name as USMH_DSMH_Direction_date.mpg)
 - Comments
- D. Immediately after cleaning, televise the sewer line to document its condition and to locate existing points of infiltration or other defects. Notify the ENGINEER 24 hours in advance of any TV inspection so that the ENGINEER may observe inspection operations.
- E. Perform TV inspection of the sewer as follows:
1. A new inspection shall be started where a manhole, junction, or diversion chamber is located. This includes new manholes, junctions, or diversion chambers identified in the field, but not previously identified in ENGINEER mapping. Therefore, no manholes, junctions, or diversion chambers shall be at a midpoint of an inspection log, only at the beginning and the end of each inspection. Inspection runs shall begin and end at manholes or junctions unless an obstruction is encountered. Lateral connections from inlets/catch basins, material changes or breaks in grade are not approved locations to begin/end an inspection. Said features shall be logged on the recording. If CONTRACTOR uses a lateral connection from inlets/catch basins, material changes or breaks in grade as a begin/end point for televising, ENGINEER will reject said segment and the sewer data shall be reorganized to match the data requirements at no additional cost to ENGINEER.
 2. Perform Survey TV Inspection immediately after cleaning.
 - a. Move the camera through the line in either direction at a uniform rate not exceeding 30 feet per minute, stopping when necessary to ensure proper documentation of the sewer's condition. The intent is to perform the inspection per the NASSCO and SCREAMTM standards. It may be necessary for a lower rate of speed depending on the defects encountered.

- b. Use manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions to move the camera through the sewer line.
 - c. Quantify visible leakage of extraneous flow into the sewer or other sags or defects in the sewer and record on electronic log and audio videotape. The video recording may be paused during observation. Record results of the flow observed on videotape and inspection logs.
3. Perform Post-Installation TV Inspection to confirm completion of rehabilitation work or proper installation of new sewers. Verify that the rehabilitation work or new sewer construction conforms to the requirements of the Specifications. Provide a color, digital recording showing the completed Work. Prepare and submit a log providing location of any discrepancies.
4. Camera shall pan beginning and ending manholes to demonstrate that all debris has been removed. Camera operator shall slowly pan clamped joints, and when pipe material transitions from one material to another. A log shall be completed for every segment that is submitted to the ENGINEER.
5. Inspections shall be from center of the starting manhole to the center of the ending manhole. Distances along the pipe should be measured from the center of the upstream manhole. Measurement meters shall be accurate to the nearest foot per 100 feet of sewer being televised within the particular section of pipe (section of pipe being defined as the length of pipe between the upstream and downstream MHs). Prior to recording the location of defects and service connections, slack in the cable of the television inspection camera shall be taken up to assure metering device is designating proper footage. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape, or other suitable device.
6. Center the camera in the middle of the pipe.
7. Stop at every defective joint for a time long enough to properly assess and code the defective joint. Pan and tilt to observe and document areas of apparent deteriorated pipe surface.
8. Stop at every lateral connection. Center the camera so that the lighting and the pan and tilt view can be used to inspect as far into the lateral connection as possible. Record all defects found in the service connection. Observe top, bottom and sides of lateral connections. Where lateral flow is observed, observe flows from service connections for a length of time long enough to ascertain if the flow is sanitary or extraneous flow. The video recording may be paused during observation. Record results of the flow observed

- on the inspection. The inspection of the service lateral itself is not to be performed as part of the sewer mainline inspection.
9. TV inspection recordings shall be continuous for each pipe segment.
 10. CONTRACTOR is responsible for adjusting light levels, cleaning fouled or fogged lenses, and allowing vapor to dissipate from camera lights in order to produce acceptable recordings.
 11. Sewer inspections not meeting the requirements set forth in this specification as determined by ENGINEER shall be re-performed at no additional cost to ENGINEER until the inspection meets to ENGINEER's satisfaction.
 12. CONTRACTOR shall complete the post-installation CCTV within 30 days after the acceptance of the Mandrel test.

3.2 FLOW CONTROL

- A. No flow will be allowed in the line while performing Post-Installation TV Inspection.

3.3 ACCEPTANCE OF WORK

- A. Rehabilitation or completion of new sewer installation work shall only be accepted if no defects are found in the line upon TV inspection as determined by the ENGINEER.
- B. Contractor shall repair all defects to the piping in a manner acceptable to the ENGINEER at no additional cost to the ENGINEER.

3.4 INSPECTION DELIVERABLES

- A. Pipe inspection logs shall be submitted as specified in Section 2.1
- B. The CCTV videos shall be provided as specified in Section 2.1.
- C. All videos shall be divided into separate files for each manhole to manhole segment.
- D. Digital Inspection Recordings
 1. Provide digital inspection recordings. Inspection recordings must be viewable on a standard 19" computer monitor.
 2. Recording shall be of a quality sufficient for the ENGINEER to evaluate the condition of the sewer and manholes, locate the sewer service connections, and verify cleaning. If ENGINEER determines that the quality is not sufficient, CONTRACTOR shall re-televiser the sewer segment and/or re-inspect the manhole and provide a new recording and report at no additional compensation.

Camera distortions, inadequate lighting, dirty lens, or blurred/hazy picture will be cause for rejection.

3. Multiple project areas may be included on a given submittal, but the files must be organized in individual project folders. Each pipe segment must be its own electronic file. Electronic recording file must allow snap scrolling to allow easy and quick access of the entire recording.
4. Each submittal must have a file index whose name contains the pipe segment reference number.
5. Label each submittal with the following information:
 - a. Pipe Segments
 - b. CONTRACTOR's Name
 - c. Project Name
 - d. Contract Number
 - e. Inspection Type:
 - f. Date Televised

++ END OF SECTION ++

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install cast-in-place concrete, reinforcement and related materials.

B. Coordination:

1. Review installation procedures under other Sections and coordinate the installation of items that must be installed in the concrete.

1.2 QUALITY ASSURANCE

A. Source Quality Control:

1. Concrete Testing Service:
 - a. ENGINEER shall employ acceptable testing laboratory to perform materials evaluation, testing and design of concrete mixes.

B. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown or specified.

1. ACI 301, Specifications for Structural Concrete for Buildings (includes ASTM Standards referred to herein except ASTM A 36).
2. ACI 304, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
3. ACI 305, Hot Weather Concreting.
4. ACI 306, Cold Weather Concreting.
5. ACI 315, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures.
6. ACI 318, Building Code Requirements for Reinforced Concrete.
7. ACI 347, Guide to Formwork for Concrete.
8. ACI 350, Environmental Engineering Concrete Structures.
9. ASTM A 36, Specification for Structural Steel.
10. Concrete Reinforcing Steel Institute, Manual of Standard Practice, includes ASTM Standards referred to herein.

1.3 SUBMITTALS

- A. Samples: Submit samples of materials as specified and may be requested by ENGINEER, including names, sources and descriptions.

- B. Shop Drawings: Submit for approval the following:
1. Copies of manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures, bonding agents, and concrete related materials.
 2. Drawings for fabrication, bending, and placement of concrete reinforcement, and reinforcement accessories. Comply with ACI 315, Chapters 1 through 7.
 3. Concrete Mix Design Report:
 - a. All concrete mix design report shall be submitted to ENGINEER at least 15 days prior to start of Work. Do not begin concrete production until mixes have been reviewed and are acceptable to ENGINEER. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by ENGINEER.
 - b. Concrete mix design proportions.
 - c. Mill test reports covering chemical and physical properties of cement included in concrete design mix.
 - d. Sieve analysis report of fine and coarse aggregates to show compliance with specified requirements.
 - e. Manufacturer's literature on all admixtures used in the mix design.
 - 1) All admixtures must be included and tested in the concrete design mix to predetermine satisfactory results.
- C. Laboratory Batch Trial Test Reports: ENGINEER'S review will be for general information only. Production of concrete to comply with specified requirements is the responsibility of CONTRACTOR.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver concrete reinforcement materials to the site bundled, tagged and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.
- B. All materials used for concrete must be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer. Bins or platforms having hard clean surfaces shall be provided for storage. Suitable means shall be taken during hauling, piling and handling to insure that segregation of the coarse and fine aggregate particles does not occur and the grading is not affected.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type II.
- B. Aggregates: ASTM C 33.
 - 1. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances. Dune sand, bank run sand and manufactured sand are not acceptable.
 - 2. Coarse Aggregate: Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:
 - a. Crushed stone, processed from natural rock or stone.
 - b. Washed gravel, either natural or crushed. Use of slag and pit or bank run gravel is not permitted.
- C. Coarse Aggregate Size: Size to be ASTM C 33, Nos. 57 or 67, unless permitted otherwise by ENGINEER.
- D. Water: Clean, drinkable.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Water-Reducing Admixture: ASTM C 494, Type A. Only use admixtures which have been tested and accepted in mix designs. Only to be added onsite by a certified admixture representative of the concrete supplier.
- G. Water-Reducing High Range Admixture: ASTM C 494, Type F/G. Only use admixtures which have been tested and accepted in mix designs. Only to be added onsite by a certified admixture representative of the concrete supplier.

2.2 CONCRETE

- A. Proportioning and Design Mix
 - 1. Minimum compressive strength at 28 days: 4000 psi.
 - 2. Maximum water cement ratio by weight: 0.44.
 - 3. Minimum cement content: 564 pounds per cubic yard.
 - 4. Normal weight: 145 pounds per cubic foot.
 - 5. Use air-entraining admixture in all concrete: provide not less than 4 percent nor more than 8 percent entrained air for all concrete.
 - 6. Slump Limits:
 - a. Proportion and design mixes to result in concrete slump at the point of placement of not less than 1 inch and not more than 4 inches. If Water-Reducing Admixtures or Superplasticizers are used slump after addition of the admixture shall not exceed 8 inches.

7. Calcium Chloride: Do not use calcium chloride in concrete, unless otherwise authorized in writing by ENGINEER. Do not use admixtures containing calcium chloride.

2.3 FORM MATERIALS

- A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
- B. Exposed Concrete Surfaces: Acceptable panel-type to provide continuous, straight, smooth, as-cast surfaces. Use largest practical sizes to minimize form joints.
- C. Unexposed Concrete Surfaces: Suitable material to suit project conditions.
- D. Provide 3/4-inch chamfer at all exposed corners.
- E. Form Ties:
 1. Provide factory-fabricated, removable or snapoff metal form ties, designed to prevent form deflection, and to prevent spalling of concrete surfaces upon removal. Materials used for tying forms will be subject to approval of ENGINEER.
 2. Unless otherwise shown, provide ties so that portion remaining within concrete after removal of exterior parts is at least 1-inch from the outer concrete surface. Unless otherwise shown, provide form ties that will leave a hole no larger than 1-inch diameter in the concrete surface.
 3. Ties for exterior walls and walls subject to hydrostatic pressure shall have waterstops.
 4. Provide wood or plastic cones for ties, where concrete is exposed in the finish structure and in the interior of tanks.
 5. Wire ties are not acceptable.

2.4 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60.
- B. Welded Wire Fabric: ASTM A 185.
- C. Steel Wire: ASTM A 82.
- D. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place.
 1. Use wire bar type supports complying with CRSI recommendations, except as specified below. Do not use wood, brick, or other unacceptable materials.
 2. For slabs on grade, use supports with sand plates or horizontal runners where base materials will not support chair legs.

3. For all concrete surfaces, where legs of supports are in contact with forms, provide supports complying with CRSI, Manual of Standard Practice as follows:
 - a. Either hot-dip galvanized, plastic protected or stainless steel legs.
- E. Adhesive Dowels:
 1. Where adhesive dowels are shown or required to be installed into concrete, adhesive material shall be used for the installation of all reinforcing bars.
 2. Adhesive Material:
 - a. Capsule or injectable adhesive material shall be a two-component system which includes a hardener and a resin.
 - b. Product and Manufacturer: Provide adhesive material by one of the following:
 - 1) HY 150 or HVA capsule by Hilti Fastening Systems, Inc.
 - 2) Power-Fast or Needle-Capsule by Powers Fastening, Inc.
 - 3) Or equal.
 3. Dowel:
 - a. Dowel reinforcing bars shall meet the ASTM standards for Grade 60, A615 steel.
- F. Form Savers: Form savers may be used as a mechanical connection in applications where drilling holes in form material is not desired. This connection shall be a full mechanical connection that shall develop in tension or compression, as required, at least 125 percent of specified yield strength (f_y) of the bar in accordance with ACI 318 Section 12.14.3.
 1. Product and Manufacturer: Provide one of the following:
 - a. Form Saver by Lenton Rebar Splicing Division of Erico Products, Inc.
 - b. Or equal.

2.5 RELATED MATERIALS

- A. Construction Joint Waterstops
 1. Polyvinylchloride (PVC) Waterstops:
 - a. Provide PVC waterstops complying with Corps of Engineers CRD-C572.
 - b. Provide serrated type with a minimum thickness of 3/8 inch by a minimum width of 6 inches may be provided in specific applications as approved by the ENGINEER.
 - c. Product and Manufacturer: Provide PVC waterstops as manufactured by one of the following:
 - 1) Style No. 783 or No. 724, Greenstreak Plastic Products company.
 - 2) Style No. R6-38T or No. RSB6-38, Vinylex Corporation.
 - 3) Or equal.
 2. Adhesive Waterstop:
 - a. Provide preformed adhesive waterstop in construction joint locations where shown, or as alternative to PVC waterstop where appropriate.

- b. The preformed waterstop shall meet or exceed all requirements of Federal Specifications SS-S-210A, "Sealing Compounds for Expansion Joints".
 - c. Product and Manufacturer: Provide waterstops as manufactured by one of the following:
 - 1) Synko-Flex Waterstop by Synko-Flex Products, Division of Henry Products, Inc.
 - 2) Or equal.
 - 3. Hydrophilic Waterstops:
 - a. Hydrophilic waterstop may be used as an alternate to the adhesive waterstop.
 - b. Product and Manufacturer: Provide waterstops as manufactured by one of the following:
 - 1) Hydrotite CJ-0725-3K and Leakmaster LV-1, Greenstreak Plastic Products Company.
 - 2) Adeka MC201OM and P201 by Adeka, Inc.
 - 3) Or equal.
 - B. Membrane-Forming Curing compound: ASTM C 309, Type I-D.
 - 1. Provide without fugitive dye when requested by ENGINEER.
 - C. Epoxy Bonding Agent:
 - 1. Two-component epoxy resin bonding agent.
 - a. Product and Manufacturer: Provide one of the following:
 - 1) Sikadur 32, Hi-Mod LPL, as manufactured by Sika Chemical Corporation.
 - 2) Epoxitite Binder (Code No. 2390), as manufactured by A.C. Horn, Incorporated.
 - 3) Or equal.
 - D. Latex Bonding Adhesive:
 - 1. Provide a latex bonding adhesive formulated for use in both interior and exterior locations. The bonding adhesive shall be stable in submerged locations and shall not be affected by chlorine. Adhesive shall be capable of being applied to damp or dry surfaces. The latex bonding adhesive shall comply with ASTM C1059, Type II, where specified.
 - 2. Product and Manufacturer: Provide one of the following:
 - a. Weld-Crete by Larsen Products Corp.
 - b. Or equal.

2.6 GROUT

- A. Nonshrink Grout:
 - 1. Prepackaged nonstaining cementitious grout requiring only the addition of water at the job site.
 - 2. Product and Manufacturer: Provide one of the following:
 - a. Euco N-S, as manufactured by the Euclid Chemical Company.
 - b. Masterflo 713, as manufactured by Master Builders Company.

c. Or equal.

B. Grout Fill:

1. Except where otherwise specified use 1 part cement to 3 parts sand complying with the following:
 - a. Cement: ASTM C 150, Type II.
 - b. Fine and Coarse Aggregate (No. 7) meeting ASTM C 33.
 - c. Specified 28-day Compressive Strength: 3,000 psi.
 - d. Maximum Water-Cement Ratio by Weight: 0.50.
 - e. Air Content Percentage $7 \pm 1\%$.
 - f. Minimum Cement Content in Pounds per Cubic Yard: 611.

PART 3 - EXECUTION

3.1 INSPECTION

- A. CONTRACTOR and his installer shall examine the substrate and the conditions under which Work is to be performed and notify ENGINEER in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.2 FORMWORK

- A. Construct the concrete members and structures to correct size, shape, alignment, elevation and position, complying with ACI 347.
- B. Provide openings in formwork to accommodate Work of other trades. Accurately place and securely support items built into forms.
- C. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during and after concrete placement if required to eliminate mortar leaks.

3.3 REINFORCEMENT MATERIALS

- A. Comply with the applicable recommendations of specified codes and standards, and CRSI, Manual of Engineering and Placing Drawings, for details and methods of reinforcement placement and supports.
- B. Clean reinforcement to remove loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- C. Position, support, and secure reinforcement against displacement during formwork construction or concrete placement, including sidewalks. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
1. Place reinforcement to obtain the minimum concrete coverages as shown and as specified in ACI 318. Arrange, space, and securely tie bars and bar

- supports together with 16 gage wire to hold reinforcement accurately in position during concrete placement operations. Set with ties so that twisted ends are directed away from exposed concrete surfaces.
2. Reinforcing steel shall not be secured to forms with wire, nails or other ferrous metal. Metal supports subject to corrosion shall not touch formed or exposed concrete surfaces.
- D. Provide sufficient numbers of supports of strength required to carry reinforcement. Do not place reinforcing bars more than 2 inches beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- E. Splices:
1. Provide standard reinforcement splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements shown for minimum lap of spliced bars in accordance with ACI 318.
- F. Install welded wire fabric in as long lengths as practical, lapping at least one mesh. Locate and support fabric by metal chairs, runners, bolsters, spacers and hangers, as required for proper placement of the concrete.
- G. Installation of Embedded Items: Set and build into the Work anchorage devices and embedded items required for other Work that is attached to, or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided under other Sections and other contracts for locating and setting. Refer also to Paragraph 1.1.B., Coordination.
- H. Adhesive Dowels:
1. Drilling equipment used and installation of adhesive dowel shall be in accordance with manufacturer's instructions.
2. Assure that embedded items are protected from damage and are not filled in with concrete.
3. Unless otherwise shown or approved by ENGINEER conform to following for adhesive dowels:

<u>Bar Size</u>	<u>Embedment Depth</u>
#3	3 ¾"
#4	5 ½"
#5	7"
#6	8 ½"
#7	10"
#8	11 ¾"
#9	12 ¾"

(If an alternate adhesive material is submitted, CONTRACTOR must submit embedment depths per manufacture’s recommendation. Embedment depths

shall be based on a compressive strength of 2000 psi when embedded into existing concrete.)

4. The CONTRACTOR shall comply with the adhesive material manufacturer's installation instructions on the hole diameter. The CONTRACTOR shall properly clean out the hole utilizing a synthetic brush and compressed air to remove all loose material from the hole, prior to installing adhesive capsules or material. Proper mixing of the two-component system shall be done to the manufacturer's recommendations.
5. Adhesive material manufacturer's representative shall observe and demonstrate the proper installation procedures for the adhesive dowels and adhesive material at no additional expense to the ENGINEER. Each installer shall be certified in writing by the manufacturer to be qualified to install the adhesive dowels.

3.4 CONSTRUCTION JOINTS

- A. Comply with ACI 301, Chapter 6, and as specified below.
- B. Locate and install construction joints as shown. Additional construction joints shall be located as follows:
 1. In walls locate joints at a spacing of 50 feet maximum.
 2. Provide other additional construction joints as required to satisfactorily complete all work.
- C. Horizontal Joints:
 1. Roughen the surface in an acceptable manner that exposes the aggregate uniformly and does not leave laitance, loosened particles of aggregate, or damaged concrete at the surface.
 2. Remove laitance, waste mortar or other substance which may prevent complete adhesion.
 3. For concrete over 45 days old, apply concrete epoxy bonding adhesive prior to placing new concrete.
- D. Vertical Joints:
 1. Roughen the surface in an acceptable manner that exposes the aggregate uniformly and does not leave laitance, loosened particles of aggregate, or damaged concrete at the surface.
 2. Remove laitance, waste mortar or other substance which may prevent complete adhesion.
 3. For concrete over 45 days old, apply concrete epoxy bonding adhesive prior to placing new concrete.

3.5 BONDING TO HARDENED CONCRETE

- A. The surface of hardened concrete upon which fresh concrete is to be placed shall be rough, clean, sound, and damp. Before placement of new plastic concrete, the hardened surface shall be cleaned of all laitance and foreign substances (including curing compound), washed with clean water and wetted thoroughly.

- B. For bonding to hardened concrete less than 30 days old, coarse aggregate shall be omitted from the first batch or batches of concrete placed against hardened concrete. The mortar puddle shall cover the hardened concrete with at least 2 inches at every point.
- C. Use epoxy bonding agent for the following:
 - 1. Bonding of fresh concrete to concrete cured greater than 30 days or to existing concrete.
 - 2. Handle and store epoxy adhesive in compliance with the manufacturer's printed instructions, including safety precautions.
 - 3. Mix the epoxy adhesive in complete accordance with the instructions of the manufacturer.
 - 4. Before placing fresh concrete, thoroughly roughen and clean hardened concrete surfaces and coat with epoxy grout not less than 1/16-inch thick. Place fresh concrete while the epoxy material is still tacky, without removing the in-place grout coat, and as directed by the epoxy manufacturer.

3.6 LATEX BONDING ADHESIVE

- A. Use latex bonding adhesive as an alternative to epoxy bonding agent in specific applications as approved by the ENGINEER.
- B. Handle and store latex bonding adhesive in compliance with the manufacturer's printed instructions, including safety precautions.
- C. Mix the latex bonding adhesive in complete accordance with the instructions of the manufacturer.
- D. Before applying latex bonding adhesive, thoroughly roughen and clean hardened concrete surfaces.
- E. Latex bonding adhesive shall not be exposed to water from the time it is placed up to a period of at least 7 days after the concrete has been placed.

3.7 CONCRETE PLACEMENT

- A. CONTRACTOR is solely responsible for the means and methods used to properly transport concrete onsite from the unloading point to the point of placement. The mechanism and equipment used to properly transport concrete shall be closely considered when the CONTRACTOR is planning his Work. Pumping of concrete is not required, however, if the CONTRACTOR fails to place the concrete to the satisfaction of the ENGINEER by means other than pumping, the concrete shall be pumped by the CONTRACTOR at no additional cost to the ENGINEER.
- B. Concrete shall not be placed until all reinforcement materials are inspected and permission for placing concrete is granted by ENGINEER. All concrete placed in violation of this provision will be rejected.

- C. Inspection: Notify ENGINEER at least 1 full working day in advance before starting to place concrete.
- D. Manufacturing and delivery shall be in accordance with ASTM C 94.
- E. Discharge Time:
 - 1. As determined by set time, do not exceed 1-1/2 hours after adding cement to water unless special approved time delay admixtures are used. Coordinate time delay admixture information with manufacturer and ENGINEER prior to placing concrete.
 - 2. Maintain required slump throughout time of concrete placement and consolidation. Discontinue use of high range water reducing admixture (superplasticizers) and provide new mix design if it fails to maintain slump between 4 to 6 inches and produce good consolidation for the length of time required. Redesign mix adjusting set control admixtures to maintain setting time in range required.
- F. Job-Site Mixing: Not permitted for this project.
- G. All concrete for liquid retaining structures, and all concrete in contact with earth, water, or exposed directly to the elements shall be watertight.
- H. Concrete Placement: Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.
- I. Provide sufficient illumination in the interior of forms so concrete deposition is visible, permitting confirmation of consolidation quality.
- J. Make all concrete solid, compact and smooth, and free of laitance, cracks and cold joints.
- K. Pumping of Concrete:
 - 1. Provide standby pump, conveyor system, crane and concrete bucket, or other system onsite during pumping, for adequate redundancy to assure completion of concrete placement without cold joints in case of primary placing equipment breakdown.
 - 2. Minimum Pump Hose (Conduit) Diameter: 4 inches.
 - 3. Replace pumping equipment and hoses (conduits) that are not functioning properly.
- L. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of forms.
 - 1. Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude as required to consolidate concrete in section being placed.
 - 2. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete.

3. Consolidation Equipment and Methods: ACI 309R.
 4. During concrete placement, vibration consolidation shall not exceed distance of 3 feet from point of top of concrete being placed.
 5. Vibrate concrete in vicinity of joints to obtain impervious concrete.
- M. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement, and curing.
1. In hot weather comply with ACI 305.
 2. In cold weather comply with ACI 306.

3.8 CURING

- A. Curing: Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours or apply curing compound immediately after final floating and finish. Continue curing through use of moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protection as required to prevent damage to exposed concrete surfaces.

3.9 FINISHES

- A. Slab Finish:
1. After placing concrete slabs, do not work the surface further until ready for floating. Begin floating when the surface water has disappeared or when the concrete has stiffened sufficiently. Use a wood float only. Check and level the surface plane to a tolerance not exceeding 1/4-inch in 10 feet when tested with a 10 foot straightedge placed on the surface at not less than 2 different angles. Cut down high spots and fill all low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat the surface to a uniform, smooth, granular texture.
 2. After floating, begin the first trowel finish operation using a power-driven trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface.
 3. Consolidate the concrete surface by the final hand troweling operation. Finish shall be free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8-inch in 10 feet when tested with a 10-foot straight edge. Grind smooth surface defects which would telegraph through applied floor covering system.
 4. Use trowel finish for the following:
 - a. Interior exposed slabs unless otherwise shown or specified.
 5. Apply non-slip broom finish to exterior concrete slab and elsewhere as shown on the Drawings.
- B. Formed Surfaces:
1. Rough Form Finish:
 - a. Standard rough form finish shall be the concrete surface having the texture imparted by the form material used, with tie holes and defective areas repaired and patched with mortar of 1 part cement to 1 1/2 parts

- sand and all fins and other projections exceeding 1/4-inch in height rubbed down or chipped off.
- b. Use rough form finish for the following:
 - 1) Exterior vertical surfaces up to 1 foot below grade.
 - 2) Interior exposed vertical surfaces of liquid containers up to 1 foot below liquid level.
 - 3) Interior and exterior exposed beams and undersides of slabs.
 - 4) Other areas shown.
 - 2. Smooth Form Finish:
 - a. Produce smooth form finish by selecting form materials which will impart a smooth, hard, uniform texture. Arrange panels in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas as above with all fins or other projections completely removed and smoothed.
 - b. Use smooth form finish for surfaces that are to be covered with a coating material. The material may be applied directly to the concrete or may be a covering bonded to the concrete such as waterproofing, dampproofing, painting or other similar system.
 - 3. Smooth Rubbed Finish:
 - a. Provide smooth rubbed finish to concrete surfaces which have received smooth form finish as follows:
 - 1) Rubbing of concrete surfaces not later than the day after form removal.
 - 2) Moistening of concrete surfaces and rubbing with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
 - b. Except where surfaces have been previously covered as specified above, use smooth rubbed finish for the following:
 - 1) Interior exposed walls and other vertical surfaces.
 - 2) Exterior exposed walls and other vertical surfaces down to 1 foot below grade.
 - 3) Interior and exterior horizontal surfaces, except exterior exposed slabs and steps.
 - 4) Interior exposed vertical surfaces of liquid containers down to 1 foot below liquid level.
 - 5) Other areas shown.
 - 4. Grout Cleaned Finish:
 - a. Provide grout cleaned finish to concrete surfaces which have received smooth form finish as follows:
 - 1) Combine 1 part portland cement to 1-1/2 parts fine sand by volume, and mix with water to the consistency of thick paint. Blend standard portland cement and white portland cement, amounts determined by trial patches, so that the final color of dry grout will closely match adjacent concrete surfaces.
 - 2) Thoroughly wet the concrete surface and apply grout uniformly by brushing or spraying immediately to the wetted surfaces.

Scrub surface with cork float or stone to coat surface and fill surface holes. Remove excess grout by scraping, followed by rubbing with clean burlap to remove any visible grout film. Keep grout damp during the setting period by means of fog spray at least 36 hours after final rubbing. Complete any area in the same day it is started, with the limits of any area being natural breaks in the finished surface.

- b. Except where surfaces have been previously covered as specified above, use grout cleaned finish for the following:
 - 1) Interior exposed walls and other vertical surfaces.
 - 2) Exterior exposed walls and other vertical surfaces down to 1 foot below grade.
 - 3) Interior and exterior horizontal surfaces, except exterior exposed slabs and steps.
 - 4) Interior exposed vertical surfaces of liquid containers down to 1 foot below liquid level.
 - 5) Other areas shown.
- 5. Related Unformed Surfaces:
 - a. At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike off smooth and finish with a texture matching the adjacent formed surfaces. Continue the final surface treatment of formed surfaces uniformly across the adjacent unformed surfaces, unless otherwise shown.

3.10 GROUT PLACEMENT

- A. Nonshrink:
 - 1. Place nonshrink grout as shown and in accordance with manufacturer's instructions. If manufacturer's instructions conflict with the Specifications do not proceed until ENGINEER provides clarification.
 - 2. Drypacking of nonshrink grout will not be permitted.
 - 3. Placing grout shall conform to the temperature and weather limitations described in Article 3.4 above.
- B. Grout Fill:
 - 1. Grout Fill shall be placed, cured, and finished as described in Article 3.7, 3.8 and 3.9.

3.11 FIELD QUALITY CONTROL

- A. Reinforcement Materials
 - 1. The CONTRACTOR shall correct improper workmanship, remove and replace, or correct as instructed, found unacceptable or deficient.
 - 2. Adhesive Dowels:
 - a. ENGINEER will retain an independent testing laboratory to perform field quality testing of installed adhesive dowels. A minimum of ten percent of the adhesive dowels shall be tested to fifty percent of the yield capacity of the reinforcing bar.

- b. CONTRACTOR shall provide access for the testing agency to places where work is being produced so that required inspection and testing can be accomplished.
- c. If failure of any of the adhesive dowels occur, the CONTRACTOR will be required to pay for the costs involved in testing the remaining ninety percent of the adhesive dowels.
- d. The CONTRACTOR shall pay for all corrections and subsequent tests required to confirm the integrity of the dowels.
- e. The independent testing and inspection agency shall complete a report on each area. The report should summarize the observations made by the inspector and be submitted to the ENGINEER.

B. Concrete Work

- 1. Quality Control: ENGINEER'S testing laboratory will perform sampling and testing during concrete placement, as follows:
 - a. Sampling: ASTM C 172.
 - b. Slump: ASTM C 143, one test for each load at point of discharge.
 - c. Air Content: ASTM C 31, one for each set of compressive strength specimens.
 - d. Compressive Strength: ASTM C 39, one set of 4 cylinders for each 50 cubic yards or fraction thereof of each class of concrete as directed by ENGINEER; 1 specimen tested at 7 days, 2 specimens tested at 28 days, 1 specimen tested at 56 days.
 - e. Report test results in writing to ENGINEER on same day tests are made.
- 2. Cut out and properly replace to the extent ordered by ENGINEER, or repair to the satisfaction of ENGINEER, surfaces which contain cracks or voids, are unduly rough, or are in any way defective. Patches or plastering will not be acceptable.
- 3. Repair, removal, and replacement of defective concrete as ordered by ENGINEER shall be at no additional cost to ENGINEER.

++ END OF SECTION ++

SECTION 05540

CASTINGS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish castings.
 - 2. Castings include metal items that are not a part of the miscellaneous metal fabrications or metal systems in other Sections of these Specifications.
 - 3. If existing castings are available and deemed acceptable for reuse from existing manholes by the ENGINEER, the CONTRACTOR shall use these existing Castings.
- B. Castings shall be for the following types of construction:
 - 1. Manholes.
- C. Related Sections:
 - 1. Section 02606, Manholes.

1.2 QUALITY ASSURANCE

- A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
 - 1. ASTM A 48, Standard Specification for Gray Iron Castings.
- B. Shop Assembly:
 - 1. Preassemble items in the shop to the greatest extent possible, so as to minimize field splicing and assembly of units at the site. Disassemble units only to the extent necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
 - 1. Fabrication and erection of all casting assemblies. Include plans, elevations, and details of sections and connections. Show anchorage and accessory items.
 - a. Include setting drawings for location and installation of castings and anchorage devices.
 - 2. Copies of manufacturer's specifications, load tables, dimension diagrams, anchor details and installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gray Iron Castings: ASTM A 48, Class 30A.
- B. Manhole Frames with Solid Covers:
 - 1. Neenah Foundry Co., Model R-1642 or East Jordan, Model 1045
 - 2. Bolt frame to manhole cone section with four (4) 5/8-inch stainless steel expansion anchors.
 - 3. One consealed pick hole.

2.2 DESIGN AND FABRICATION

- A. Design round frames and covers to prevent rocking and rattling under traffic.
- B. Manhole Steps:
 - 1. CONTRACTOR has the option to provide aluminum or reinforced polypropylene manhole steps as specified below.
 - 2. All manhole steps provided for the Project must be fabricated from the same material and must meet minimum OSHA requirements.
 - 4. Aluminum Manhole Steps: Forged aluminum alloy, ASTM 221.
 - 5. Reinforced Polypropylene Manhole Steps: ½ inch Grade 60 steel reinforcing rod, ASTM A-615, encapsulated in copolymer polypropylene, ASTM D 2146-68 under Type II, Grade 16906.
- C. Fabricate castings true to pattern so that component parts fit together.
- D. Identification Markings:
 - 1. Provide markings on all manhole lids.
 - 2. All manhole lids shall be provided with the words "SANITARY SEWER" across the center of the lid.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow manufacturer's printed instructions and approved Shop Drawings.
- B. Set castings accurately to required location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Brace temporarily or anchor temporarily in formwork.

++ END OF SECTION ++

P E R M I T N O T I C E

**DEPARTMENT OF THE ARMY - CORPS OF ENGINEERS
KENTUCKY DIVISION OF WATER
LETTER OF PERMISSION AUTHORIZATION
and
INDIVIDUAL WATER QUALITY CERTIFICATION**

PROJECT: Item No. 6-8105
Campbell County, KY
New Route from John's Hill Rd to Three Mile Rd

The Section 404 and 401 activities for this project have been permitted under the authority of the Department of the Army Letter of Permission and Kentucky Division of Water Individual Water Quality Certification. In order for this authorization to be valid, the attached conditions must be followed. The contractor shall post a copy of this Letter of Permission and Water Quality Certification in a conspicuous location at the project site for the duration of construction and comply with the general conditions as required.

To more readily expedite construction, the contractor may elect to alter the design or perform the work in a manner different from what was originally proposed and specified. Prior to commencing such alternative work, the contractor shall obtain **written** permission from the Division of Construction, the Corps of Engineers, and the Division of Water. A copy of any request to the Corps of Engineers or Kentucky Division of Water to alter this proposal and subsequent responses shall be forwarded to the Division of Environmental Analysis, DEA Permit Coordinator, for office records and for informational purposes.



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE KY 40201-0059
FAX: (502) 315-6677
<http://www.lrl.usace.army.mil/>

6-8105

September 23, 2015

Operations Division
Regulatory Branch (South)
ID No. LRL-2009-1251-jea

Mr. John W. Purdy
Division of Environmental Analysis
Kentucky Transportation Cabinet
Frankfort, Kentucky 40622

Dear Mr. Purdy:

This letter is a revision regarding your request for a 2-year extension to Letter of Permission Permit (LOP) No. LRL-2009-1251, which authorized impacts to 725 linear feet of intermittent stream and 853 linear feet of ephemeral stream to Licking River associated with stream replacement, and culvert placement and 0.16 acre of emergent wetland impacts associated with the placement of excess fill. The proposed project is for the construction of a new route from John's Hill Road to Three Mile Creek in Campbell County, Kentucky. No changes have been made to the project plans. Authorization was requested to extend the LOP for 2 years. This letter supersedes our letter dated September 16, 2015. This requested extension is approved with the following changes to Special Conditions "2", "3", "5", and "6":

2. The permittee shall provide receipt of purchase of 0.3 wetland Adjusted Mitigation Units (AMUs) from the Northern Kentucky Mitigation Bank and 638 stream AMUs from the Northern Kentucky University (NKU) Stream and Wetland Restoration (In-Lieu Fee) Program. The AMUs must be purchased prior to the discharge of fill into "waters of the United States". Please note that the cost per credit is subject to change may increase. Inquiries regarding credit purchase from NKU may be made by calling Mr. Scott Fennell (859-448-8953), by email (fennells@nku.edu), or in writing (Northern Kentucky University Center for Environmental Restoration, 15 Clearview Drive, Highland Heights, Kentucky 41076). Contact information for purchase of credits from Northern Kentucky Mitigation Bank may be found on the Corps Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) website.

3. The permittee shall adhere to the enclosed July 31, 2015, Indiana Bat Programmatic Agreement between the U.S. Fish and Wildlife Service (USFWS), the Federal Highway Administration and the Kentucky Transportation Cabinet as modified by the USFWS letter dated July 23, 2015.

5. The permittee will comply with the enclosed conditions of the Section 401 Water Quality Certification (WQC), issued by the Kentucky Division of Water on 18 June 2015.

6. The time limit for completing the work authorized ends on **September 30, 2017**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.

All other conditions of the original permit remain in full force and effect. Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

If we can be of any further assistance, please contact us at the above address, ATTN: CELRL-OPF-S, or call me at (502) 315-6682.

Sincerely,



Jane Archer
Regulatory Specialist
Regulatory Branch

Enclosures



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE, KENTUCKY 40201-0059
<http://www.lrl.usace.army.mil/>

September 30, 2010

Operations Division
Regulatory Branch (South)
ID No. LRL-2009-1251-jea

Mr. John W. Purdy
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40622

Dear Mr. Purdy:

This is in regard to your application for a Department of the Army (DA) permit dated May 13, 2010, concerning a plan to construct a new route from John's Hill Road to Three Mile Road in Campbell County, Kentucky. We have reviewed your application and have made the following determinations: the work is minor in nature, will not have a significant impact on the environment, and should encounter no opposition.

Based on these determinations, your proposed work satisfies the Letter of Permission criteria, as specified in our regulations. Therefore, you are authorized, in accordance with 33 USC 403, for the following impacts to facilitate the new roadway:

- Fill 225 linear feet (LF) of an unnamed ephemeral tributary to Licking River (0.013 acre)
- Place 193 LF of an unnamed intermittent tributary to Licking Creek within a culvert (0.016 acre)
- Relocate 382 LF of unnamed ephemeral tributary to Licking Creek (0.026 acre)
- Fill 246 LF of an unnamed ephemeral tributary to Licking River for an excess material site (0.003 acre)
- Relocate 532 LF of an unnamed intermittent tributary to Licking Creek
Fill 0.16 acre of an existing emergent wetland

This permission is granted with the following conditions:

1. That the project be constructed in accordance with the enclosed drawings marked "Plans of Proposed Project, Campbell County, Section II AA Highway to I-275 Connector - Johns Hill Road to Three Mile Road".

2. That the permittee shall pay an in-lieu mitigation fee of \$120,048.00 to the Northern Kentucky University Research Foundation. Written proof of payment must be provided to the U.S. Army Corps of Engineers, Louisville District prior to conducting work in "waters of the United States" including wetlands.
3. That tree clearing occur only from October 15 through March 31 to avoid summer roost habitat for the Federally-listed Indiana bat.
4. That sedimentation control is implemented and maintained throughout construction and until such time as all disturbed earthen areas are revegetated.
5. The permittee will comply with the conditions of the Section 401 Water Quality Certification (WQC), issued by the Kentucky Division of Water on 27 July 2010.
6. The time limit for completing the work authorized ends on **September 29, 2015**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.
7. Upon completion of construction you are to notify the District Engineer. The enclosed Completion Report form must be completed and returned to this office.
8. You must agree to comply with the enclosed General Conditions.

This authorization will be effective as soon as we receive your signed acceptance of these conditions. Please sign and date the duplicate copy of this letter in the space provided and return the signed copy in the enclosed envelope. Note that we also perform periodic inspections to ensure compliance with our permit conditions and appropriate Federal laws.

This letter contains a proffered permit for your proposed project. If you object to this decision, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this decision you must submit a completed RFA form to the Lakes and Rivers Division Office at the following address:

Ms. Pauline D. Thorndike
U.S. Army Engineer Division
Great Lakes and Ohio River
550 Main Street - Room 10032
Cincinnati, Ohio 45202-3222
(513) 684-6212

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by November 30, 2010.

It is not necessary to submit an RFA form to the Division office if you do not object to the decision in this letter.

Also enclosed with this proffered permit is a preliminary jurisdictional determination (JD). A preliminary jurisdictional determination is not appealable and impacting "waters of the U.S." identified in the preliminary JD will result in you waiving the right to request an approved JD at a later date. An approved JD may be requested (which may be appealed), by contacting me for further instruction.

Copies of this letter will be sent to the appropriate coordinating agencies (see enclosure for addresses).

FOR THE DISTRICT ENGINEER:



Jane Archer
Regulatory Specialist, South
Regulatory Branch

Enclosures

(I accept the conditions of this authorization):


Kentucky Transportation Cabinet
Date

GENERAL CONDITIONS:

1. Discharges of dredged or fill material into "waters of the U.S." must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). In determining the minimal impact threshold, the Districts will consider the direct, secondary, and cumulative impacts of the fill or work and any mitigation measures.
2. The permittee shall provide a mitigation/monitoring plan for impacts resulting from the placement of fill into "waters of the U.S." in excess of 300 linear feet of intermittent or perennial stream; the filling of greater than 0.10 acre (4,356 sq. feet) of waters of the U.S; or work causing more than minimal effects, to compensate for impacts to the "waters of the U.S." These impact thresholds are applied for each crossing. When mitigation is required, the permittee will develop the mitigation site concurrently with, or in advance of, the site construction unless the Corps determines on a project specific basis that it is not practical to do so. This will ensure that aquatic functions are not lost for long periods of time (e.g. temporal loss) which could adversely affect water quality and wildlife. The requirement for conservation easements or deed restrictions will be determined on a project specific basis.
3. The permittee shall ensure that sedimentation and soil erosion control measures are in place prior to commencement of construction activities. These measures will remain in place and be properly maintained throughout construction. Sedimentation and soil control measures shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion. Sedimentation and erosion controls will not be placed in "waters of the U.S." except if specifically approved by the District.
4. The permittee shall ensure that areas disturbed by any construction activity, including channel and stream banks, are immediately stabilized and revegetated with a combination of non-invasive plants (grasses, legumes and shrubs) which are compatible with the affected area and will not compete with native vegetation.
5. The permittee shall ensure that no in-stream construction activity is performed during periods of high stream flow or during the fish spawning season (April 1 through June 30) without first contacting the Kentucky Department of Fish and Wildlife Resources (KDFWR) for their expertise on

impacts to the fishery resource. Additionally, the discharge of dredged and/or fill material in known waterfowl breeding and wintering areas must be avoided to the maximum extent practicable.

6. The permittee will ensure that the activity authorized will not disrupt movement of those aquatic species indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's specific purpose is to impound water.

7. The permittee shall ensure that all construction equipment is refueled and maintained on an upland site away from existing streams, drainageways and wetland areas. Heavy equipment working in wetlands must be placed on mats or other measures must be taken to minimize soil disturbance.

8. The permittee must comply with any case specific special conditions added by the Corps or by the State Section 401 Water Quality Certification (WQC). The conditions imposed in the State Section 401 WQC are also conditions of this LOP.

9. The permittee shall ensure that no activity authorized by the LOP may cause more than a minimal adverse effect on navigation.

10. The permittee shall ensure proper maintenance of any structure or fill authorized by the LOP, in good condition and in conformance with the terms and conditions of the LOP, including maintenance to ensure public safety. The permittee is not relieved of this requirement if the permitted activity is abandoned, although the permittee may make a good faith transfer to a third party. Should the permittee wish to cease to maintain the authorized activity or desire to abandon it without a good faith transfer, the permittee must obtain a modification to the LOP from the Corps, which may require restoration of the area.

11. The permittee shall not perform any work within any Wild and Scenic Rivers or in any river officially designated as a "study river" for possible inclusion in the system, unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity authorized by the LOP will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal Land Management agency in the area (e.g. U.S. Forest Service, Bureau of Land Management, the National Parks Service, or the

U.S. Fish and Wildlife Service).

12. The permittee shall not perform any work under the LOP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. The permittee shall notify the Corps and coordinate the proposed action with the USFWS to determine if any listed species or critical habitat might be affected and/or adversely modified by the proposed work. No activity is authorized under the LOP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed. At the direction of the Corps, the permittee shall complete the necessary consultation with the USFWS, satisfying the requirements of Section 7(a)(2) of the Endangered Species Act. The permittee shall not begin work until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Authorization of an activity under the LOP does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act.

Obligations under Section 7 of the Act must be reconsidered by the Corps Districts if (1) new information reveals impacts of the proposed action may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

13. The permittee shall not perform any activity under the LOP which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The permittee must notify the District Engineer if the activity authorized by the LOP may affect any historic properties listed, determined to be eligible or which the permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not

begin construction until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the Kentucky Heritage Council.

If the permittee discovers any previously unknown historic or archaeological remains while accomplishing the activity authorized by the LOP, work must be immediately stopped and this office immediately notified regarding the discovery. The District will initiate the Federal, Tribal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

14. The permittee shall not perform any work under the LOP where the discharge of dredged and/or fill material will occur in the proximity of a public water supply intake.

15. No activity, including structures or work in "waters of the U.S." or discharges of dredged or fill material may consist of unsuitable materials (e.g. trash, debris, car bodies, asphalt, etc.) and that materials used for construction or discharge must be free from toxic pollutants in toxic amounts.

16. The permittee shall, to the maximum extent practicable, design the project to maintain pre-construction downstream flow conditions. Furthermore, the work must not permanently restrict or impede the passage of normal or expected high flows and the structure or discharge of fill must withstand expected high flows. The project must provide, to the maximum extent practicable, for retaining excess flows from the site and for establishing flow rates from the site similar to pre-construction conditions.

17. The permittee shall ensure that all temporary fills, authorized under the LOP, be removed in their entirety and the affected areas returned to pre-construction elevation.

18. Representatives from the Corps of Engineers and/or the State of Kentucky may inspect any authorized activity or mitigation site at any time deemed necessary to ensure compliance with the terms and conditions of the LOP, Section 401 WQC, and applicable laws.

19. All work authorized by this LOP must be completed within five years after the date of the Corps authorization letter. If you find you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least three months before the expiration date.

20. The permittee, after completion of work under the LOP, shall submit a signed certification letter regarding the completed work and required mitigation, if applicable. The certification letter will include a statement that the work was done in accordance with the LOP authorization including compliance with all general and special conditions and completion of mitigation work.

21. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of the LOP.

22. For Section 10 waters, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

DIVISION OF WATER

200 FAIR OAKS LANE, 4TH FLOOR

FRANKFORT, KENTUCKY 40601

www.kentucky.gov

June 18, 2015

John Purdy
KYTC Environmental Analysis
200 Mero St., 5th Floor
Frankfort, KY 40622

Re: Water Quality Certification #2010-048-1R
NKU Connector
KYTC Item No: 6-8105
USACE No: LRL-2009-1251-jea
AI No.: 106423; Activity ID: APE20150001
UTs of Licking River
Campbell County, Kentucky

Dear Mr. Purdy:

Pursuant to Section 401 of the Clean Water Act (CWA), the Commonwealth of Kentucky certifies it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 304, 306, and 307 of the CWA, will not be violated by the above referenced project provided that the U.S. Army Corps of Engineers authorizes the activity under 33 CFR part 330, and the attached conditions are met.

All future correspondence on this project must reference **AI No. 106423**. **The attached document is your official Water Quality Certification; please read it carefully.** If you should have any questions concerning the conditions of this water quality certification, please contact Sarah Atherton of my staff at Sarah.Atherton@ky.gov or by calling (502) 564-3410.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrea Keatley".

Andrea Keatley, Acting Supervisor
Water Quality Certification Section
Kentucky Division of Water

Attachment

cc: Jane Archer, USACE: Louisville (via email: Jane.E.Archer@usace.army.mil)
Lee Andrews, USFWS: Frankfort (via email: Teresa_Hyatt@fws.gov)
John Purdy, KYTC: Environmental Analysis (via email: JPurdy@ky.gov)
Chad Von Gruenigen, Licking River Basin Coordinator (via email: Chad.VonGruenigen@ky.gov)

KTC Water Quality Certification

NKU Connector - Campbell Co
Facility Requirements
Permit Number:2010-048-1R
Activity ID No.: APE20150001

ACTV0000000001 (KYTC Item No. 6-8105) NKU Connector, North Section:

Submittal/Action Requirements:

Condition No.	Condition
S-1	The Kentucky Division of Water does not require mitigation for the proposed stream and wetland impacts associated with this project. If the Kentucky Transportation Cabinet is required to mitigate stream and/or wetland loss associated with this project due to USACE requirements, the KYTC shall submit notification: Due prior to construction commencement to the Kentucky Division of Water, Water Quality Certification Section. This notification shall contain proof of payment to Northern Kentucky University. [Clean Water Act]

Narrative Requirements:

Condition No.	Condition
T-1	The work approved by this certification shall be limited to: - 725 linear feet of intermittent stream disturbance associated with stream relocation and culvert placement (Stations 239+00 and 221+65), and 0.16 acres of emergent wetland disturbance associated with the placement of excess fill material (Station 238+30), in the Licking River drainage area, identified as Hydrologic Unit Code (HUC) 14 #05100101270150. [Clean Water Act]
T-2	All work performed under this certification shall adhere to the design and specifications set forth in the Water Quality Certification application package received by the Kentucky Division of Water on May 18, 2010. [Clean Water Act]
T-3	The Kentucky Transportation Cabinet must notify the Kentucky Division of Water, Water Quality Certification (KDOW, WQC) Section at the start of project construction. [Clean Water Act]
T-4	The Kentucky Transportation Cabinet must notify the KDOW, WQC Section once construction is complete. [Clean Water Act]
T-5	The Kentucky Transportation Cabinet is responsible for preventing degradation of waters of the Commonwealth from soil erosion. An erosion and sedimentation control plan must be designed, implemented, and maintained in effective operating condition at all times during construction. [Clean Water Act]
T-6	The Division of Water reserves the right to modify or revoke this certification should it be determined that the activity is in noncompliance with any condition set forth in this certification. [Clean Water Act]

KTC Water Quality Certification

NKU Connector - Campbell Co
Facility Requirements
Permit Number:2010-048-1R
Activity ID No.: APE20150001

ACTV0000000001 (continued):

Narrative Requirements:

Condition No.	Condition
T-7	If construction does not commence within two years of the date of this letter, this certification will become void. A letter requesting a renewal should be submitted. [Clean Water Act]
T-8	Other permits from the Division of Water may be required for this activity. If this activity occurs within a floodplain, a Permit to Construct Across or Along a Stream may be required. Please contact the Floodplains Supervisor at (502-564-3410) for more information. If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) stormwater permit shall be required from the Surface Water Permits Branch. This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must include erosion prevention and sediment control measures. Contact: Surface Water Permits Branch (SWPB) Support (502-564-3410 or SWPBsupport@ky.gov). [Clean Water Act]. [Clean Water Act]



STEVEN L. BESHEAR
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200 FAIR OAKS LANE, 4TH FLOOR

FRANKFORT, KENTUCKY 40601

www.kentucky.gov

ATTENTION APPLICANT

If your project involves one or more of the following activities, you may need more than one permit from the Kentucky Division of Water.

***building in a floodplain *road culvert in a stream**

***streambank stabilization *stream cleanout**

***utility line crossing a stream**

***construction sites greater than 1 acre**

- **Construction sites greater than 1 acre will require the filing of a Notice of Intent to be covered under the KPDES General Stormwater Permit. This permit requires the creation of an erosion control plan.**

Contact: Surface Water Permits Branch (SWPB) Support at (502) 564-3410 or SWPBsupport@ky.gov

- **Projects that involve filling in the floodplain will require a floodplain construction permit from the Water Resources Branch.**

Contact: Todd Powers

- **Projects that involve work IN a stream, such as bank stabilization, road culverts, utility line crossings, and stream alteration will require a floodplain permit and a Water Quality Certification from the Division of Water.**

Contact: Andrea Keatley

All three contacts listed above can be reached at (502) 564-3410. A complete listing of environmental programs administered by the Kentucky Department for Environmental Protection is available from Pete Goodmann by calling (502) 564-3410.

GENERAL CONDITIONS FOR WATER QUALITY CERTIFICATION

1. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
2. All dredged material shall be removed to an upland location and/or graded on adjacent areas (so long as such areas are not regulated wetlands), to obtain original streamside elevations, i.e. overbank flooding shall not be artificially obstructed.
3. In areas not riprapped or other wise stabilized, revegetation of stream banks and riparian zones shall occur concurrently with project progression. At a minimum, revegetation will approximate pre-disturbance conditions.
4. To the maximum extent practicable, all instream work under this certification shall be performed during low flow.
5. Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances where such instream work is unavoidable, then it shall be performed in such a manner and duration as to minimize resuspension of sediments and disturbance to substrates and bank or riparian vegetation.
6. Any fill or riprap including refuse fill, shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If riprap is utilized, it is to be of such weight and size that bank stress or slump conditions will not be created because of its placement.
7. If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when work will be done.
8. Removal of existing riparian vegetation should be restricted to the minimum necessary for project construction.
9. Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling 800/564-2380.

US ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT
REGULATORY BRANCH
P. O. BOX 59
LOUISVILLE, KY 40201-0059
(502) 315-6682

COMPLETION REPORT

COE ID No. _____ Date. _____			
Permittee Name: _____ Corporate Name: _____ Address: _____ _____ _____ <div style="display: flex; justify-content: space-between;"><div>Telephone No. _____</div><div>City _____ State _____ Zip Code _____</div></div>			
Agent Name: _____ Corporate Name: _____ Address: _____ _____ _____ <div style="display: flex; justify-content: space-between;"><div>Telephone No. _____</div><div>City _____ State _____ Zip Code _____</div></div>			
Location Description: _____ _____ _____ County _____ State _____ Linear Feet of Stream Impact: _____ Acres of Wetland Impact: _____			
Has all the work on this project been completed according to plans, specifications, and conditions of the permit? Yes _____ No _____ If not, explain: _____ _____ _____ _____ _____ _____ _____ <div style="text-align: right; margin-top: 20px;">_____ Permittee Signature</div>			



STEPHEN L.
BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
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FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

ATTENTION APPLICANT

If your project involves one or more of the following activities, you may need more than one permit from the Kentucky Division of Water.

- *building in a floodplain**
- *road culvert in a stream**
- *streambank stabilization**
- *stream cleanout**
- *utility line crossing a stream**
- *construction sites an acre or more**

- If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) stormwater permit shall be required from the Operational Permits Section. This permit requires the creation of an erosion control plan.

Contact Allen Ingram.

- Projects that involve filling in the floodplain will require a stream construction permit from the Floodplain Management Section.

Contact Barry Elmore.

- Projects that involve work IN a stream, such as bank stabilization, road culverts, utility line crossings, and stream alteration will require a stream construction permit and a Water Quality Certification from the Water Quality Certification Section.

Contact Alan Grant.

All three contacts listed above can be reached at 502/564-3410. A complete listing of environmental programs administered by the Kentucky Department for Environmental Protection is available from Pete Goodman by calling 502/564-3410.

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5. Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances where such instream work is unavoidable, then it shall be performed in such a manner and duration as to minimize resuspension of sediments and disturbance to substrates and bank or riparian vegetation.
6. Any fill or riprap including refuse fill, shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If riprap is utilized, it is to be of such weight and size that bank stress or slump conditions will not be created because of its placement.
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KyTC BMP Plan for Project PCN ## - #####



Kentucky Transportation Cabinet

Highway District 6

And

_____ **(2), Construction**

Kentucky Pollutant Discharge Elimination System

Permit KYR10

Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

**Transportation Improvements to AA-I-275;
Construct a new connector road from just south
of John's Hill Road (KY 2345) to Three-mile Road
(KY 2238) near the I-275 interchange.**

Project: PCN ## - #####

KyTC BMP Plan for Project PCN ## -

Project information

Note – (1) = Design (2) = Construction (3) = Contractor

1. Owner – Kentucky Transportation Cabinet, District 6

2. Resident Engineer: (2)

3. Contractor name: (2)

Address: (2)

Phone number: (2)

Contact: (2)

Contractors agent responsible for compliance with the KPDES permit requirements (3):

4. Project Control Number (2)

5. Route (Address) Highland Heights

Latitude/Longitude (project mid-point) 39/02/03, -84/28/05

6. County (project mid-point) Campbell

7. Project start date (date work will begin): (2)

8. Projected completion date: (2)

KyTC BMP Plan for Project PCN ## -

A. Site description:

1. Nature of Construction Activity (from letting project description) Construct a new connector road from just south of John's Hill Road (KY 2345) to Three-mile Road (KY 2238) near the I-275 interchange.
2. Order of major soil disturbing activities (2) and (3)
3. Projected volume of material to be moved 510,071 cu yd
4. Estimate of total project area (acres) 49.53 acres
5. Estimate of area to be disturbed (acres) 44.29 acres
6. Post construction runoff coefficient will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information.
7. Data describing existing soil condition: Refer to geotechnical sheets providing in the plan set. (2)
8. Data describing existing discharge water quality (if any)(2)
9. Receiving water name: Pooles Creek & Threemile Creek
10. TMDLs and Pollutants of Concern in Receiving Waters: N/A
11. Site map – Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.
12. Potential sources of pollutants:

The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing

KyTC BMP Plan for Project PCN ## -

and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. (3)

B. Sediment and Erosion Control Measures:

1. Plans for highway construction projects will include erosion control sheets that depict Disturbed Drainage Areas (DDAs) and related information. These plan sheets will show the existing project conditions with areas delineated by DDA within the right of way limits, the discharge points and the areas that drain to each discharge point. Project managers and designers will analyze the DDAs and identify Best Management Practices (BMPs) that are site specific. The balance of the BMPs for the project will be listed in the bid documents for selection and use by the contractor on the project with approval by the resident engineer.

Projects that do not have DDAs annotated on the erosion control sheets will employ the same concepts for development and managing BMP plans.

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as "Do Not Disturb" until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP's shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA's as the work progresses. All DDA's will have adequate BMP's in place before being disturbed.
3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:
 - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
 - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be

KyTC BMP Plan for Project PCN ## -

inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

- Clearing and Grubbing – The following BMP's will be considered and used where appropriate.
 - Leaving areas undisturbed when possible.
 - Silt basins to provide silt volume for large areas.
 - Silt Traps Type A for small areas.
 - Silt Traps Type C in front of existing and drop inlets which are to be saved
 - Diversion ditches to catch sheet runoff and carry it to basins or traps or to divert it around areas to be disturbed.
 - Brush and/or other barriers to slow and/or divert runoff.
 - Silt fences to catch sheet runoff on short slopes. For longer slopes, multiple rows of silt fence may be considered.
 - Temporary Mulch for areas which are not feasible for the fore mentioned types of protections.
 - Non-standard or innovative methods.
- Cut & Fill and placement of drainage structures - The BMP Plan will be modified to show additional BMP's such as:
 - Silt Traps Type B in ditches and/or drainways as they are completed
 - Silt Traps Type C in front of pipes after they are placed
 - Channel Lining
 - Erosion Control Blanket
 - Temporary mulch and/or seeding for areas where construction activities will be ceased for 21 days or more.
 - Non-standard or innovative methods
- Profile and X-Section in place – The BMP Plan will be modified to show elimination of BMP's which had to be removed and the addition of new BMP's as the roadway was shaped. Probably changes include:
 - Silt Trap Type A, Brush and/or other barriers, Temporary Mulch, and any other BMP which had to be removed for final grading to take place.
 - Additional Silt Traps Type B and Type C to be placed as final drainage patterns are put in place.
 - Additional Channel Lining and/or Erosion Control Blanket.
 - Temporary Mulch for areas where Permanent Seeding and Protection cannot be done within 21 days.
 - Special BMP's such as Karst Policy
- Finish Work (Paving, Seeding, Protect, etc.) – A final BMP Plan will result from modifications during this phase of construction. Probably changes include:
 - Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMP's which are sufficient to

KyTC BMP Plan for Project PCN ## -

control erosion, i.e. Erosion Control Blanket or Permanent Seeding and Protection on moderate grades.

- Permanent Seeding and Protection
 - Placing Sod
 - Planting trees and/or shrubs where they are included in the project
- BMP's including Storm Water Management Devices such as velocity dissipation devices and Karst policy BMP's to be installed during construction to control the pollutants in storm water discharges that will occur after construction has been completed are : n/a

C. Other Control Measures

1. No solid materials, including building materials, shall be discharged to waters of the commonwealth, except as authorized by a Section 404 permit.
2. Waste Materials

All waste materials that may leach pollutants (paint and paint containers, caulk tubes, oil/grease containers, liquids of any kind, soluble materials, etc.) will be collected and stored in appropriate covered waste containers. Waste containers shall be removed from the project site on a sufficiently frequent basis as to not allow wastes to become a source of pollution. All personnel will be instructed regarding the correct procedure for waste disposal. Wastes will be disposed in accordance with appropriate regulations. Notices stating these practices will be posted in the office.

3. Hazardous Waste

All hazardous waste materials will be managed and disposed of in the manner specified by local or state regulation. The contractor shall notify the Resident Engineer if there any hazardous wastes being generated at the project site and how these wastes are being managed. Site personnel will be instructed with regard to proper storage and handling of hazardous wastes when required. The Transportation Cabinet will file for generator, registration when appropriate, with the Division of Waste Management and advise the contractor regarding waste management requirements.

4. Spill Prevention

The following material management practices will be used to reduce the risk of spills or other exposure of materials and substances to the weather and/or runoff.

- **Good Housekeeping:**

KyTC BMP Plan for Project PCN ## -

The following good housekeeping practices will be followed onsite during the construction project.

- An effort will be made to store only enough product required to do the job
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure
- Products will be kept in their original containers with the original manufacturer's label
- Substances will not be mixed with one another unless recommended by the manufacturer
- Whenever possible, all of the product will be used up before disposing of the container
- Manufacturers' recommendations for proper use and disposal will be followed
- The site contractor will inspect daily to ensure proper use and disposal of materials onsite

➤ **Hazardous Products:**

These practices will be used to reduce the risks associated with any and all hazardous materials.

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data sheets (MSDS) will be reviewed and retained
- Contractor will follow procedures recommended by the manufacturer when handling hazardous materials
- If surplus product must be disposed of, manufacturers' or state/local recommended methods for proper disposal will be followed

The following product-specific practices will be followed onsite:

➤ **Petroleum Products:**

Vehicles and equipment that are fueled and maintained on site will be monitored for leaks, and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum

KyTC BMP Plan for Project PCN ## -

products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.

This project (will / will not) (3) have over 1,320 gallons of petroleum products with a total capacity, sum of all containers 55 gallon capacity and larger.

➤ **Fertilizers:**

Fertilizers will be applied at rates prescribed by the contract, standard specifications or as directed by the resident engineer. Once applied, fertilizer will be covered with mulch or blankets or worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

➤ **Paints:**

All containers will be tightly sealed and stored indoors or under roof when not being used. Excess paint or paint wash water will not be discharged to the drainage or storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.

➤ **Concrete Truck Washout:**

Concrete truck mixers and chutes will not be washed on pavement, near storm drain inlets, or within 75 feet of any ditch, stream, wetland, lake, or sinkhole. Where possible, excess concrete and wash water will be discharged to areas prepared for pouring new concrete, flat areas to be paved that are away from ditches or drainage system features, or other locations that will not drain off site. Where this approach is not possible, a shallow earthen wash basin will be excavated away from ditches to receive the wash water

➤ **Spill Control Practices**

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.

KyTC BMP Plan for Project PCN ## -

- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean up will be disposed in accordance with appropriate regulations.

D. Other State and Local Plans

This BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the NOI, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in this BMP plan). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials.

E. Maintenance

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.
- Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.
 - Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance.

F. Inspections

KyTC BMP Plan for Project PCN ## -

Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

- All erosion prevention and sediment control measures will be inspected at least once each week and following any rain of one-half inch or more.
- Inspections will be conducted by individuals that have received KyTC Grade Level II training or other qualification as prescribed by the cabinet that includes instruction concerning sediment and erosion control.
- Inspection reports will be written, signed, dated, and kept on file.
- Areas at final grade will be seeded and mulched within 14 days.
- Areas that are not at final grade where construction has ceased for a period of 21 days or longer and soil stock piles shall receive temporary mulch no later than 14 days from the last construction activity in that area.
- All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of being reported.
- Built-up sediment will be removed from behind the silt fence before it has reached halfway up the height of the fence.
- Silt fences will be inspected for bypassing, overtopping, undercutting, depth of sediment, tears, and to ensure attachment to secure posts.
- Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 70 percent of the design capacity and at the end of the job.
- Diversion dikes and berms will be inspected and any breaches promptly repaired. Areas that are eroding or scouring will be repaired and re-seeded / mulched as needed.
- Temporary and permanent seeding and mulching will be inspected for bare spots, washouts, and healthy growth. Bare or eroded areas will be repaired as needed.
- All material storage and equipment servicing areas that involve the management of bulk liquids, fuels, and bulk solids will be inspected weekly for conditions that represent a release or possible release of pollutants to the environment.

G. Non – Storm Water discharges

It is expected that non-storm water discharges may occur from the site during the construction period. Examples of non-storm water discharges include:

- Water from water line flushings.

KyTC BMP Plan for Project PCN ## -

- Water form cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- Uncontaminated groundwater and rain water (from dewatering during excavation).

All non-storm water discharges will be directed to the sediment basin or to a filter fence enclosure in a flat vegetated infiltration area or be filtered via another approved commercial product.

H. Groundwater Protection Plan (3)

This plan serves as the groundwater protection plan as required by 401 KAR 5:037.

- Contractors statement: (3)

The following activities, as enumerated by 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan, will or may be may be conducted as part of this construction project:

_____ 2. (e) land treatment or land disposal of a pollutant;

_____ 2. (f) Storing, ..., or related handling of hazardous waste, solid waste or special waste, ..., in tanks, drums, or other containers, or in piles, (This does not include wastes managed in a container placed for collection and removal of municipal solid waste for disposal off site);

_____ 2. (g) Handling of materials in bulk quantities (equal or greater than 55 gallons or 100 pounds net dry weight transported held in an individual container) that, if released to the environment, would be a pollutant;

_____ 2. (j) Storing or related handling of road oils, dust suppressants,, at a central location;

_____ 2. (k) Application or related handling of road oils, dust suppressants or deicing materials, (does not include use of chloride-based deicing materials applied to roads or parking lots);

_____ 2. (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes, (this does not include bore holes for the purpose of explosive demolition);

Or, check the following only if there are no qualifying activities

KyTC BMP Plan for Project PCN ## -

_____ There are no activities for this project as listed in 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan.

The contractor is responsible for the preparation of a plan that addresses the

401 KAR 5:037 Section 3. (3) Elements of site specific groundwater protection plan:

- (a) General information about this project is covered in the Project information;
- (b) Activities that require a groundwater protection plan have been identified above;
- (c) Practices that will protect groundwater from pollution are addressed in section C. Other control measures.
- (d) Implementation schedule – all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity;
- (e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provide to the resident engineer.
- (f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections
- (g) Certification (see signature page.)

KyTC BMP Plan for Project PCN ## - #####

Contractor and Resident Engineer Plan certification

The contractor that is responsible for implementing this BMP plan is identified in the Project Information section of this plan.

The following certification applies to all parties that are signatory to this BMP plan:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, this plan complies with the requirements of 401 KAR 5:037. By this certification, the undersigned state that the individuals signing the plan have reviewed the terms of the plan and will implement its provisions as they pertain to ground water protection.

Resident Engineer and Contractor Certification:

(2) Resident Engineer signature

Signed _____title_____, _____
Typed or printed name²signature

(3) Signed _____title_____, _____
Typed or printed name¹signature

1. Contractors Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.
2. KyTC note: to be signed by the Chief District Engineer or a person designated to have the authority to sign reports by such a person (usually the resident engineer) in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601 Reference the Project Control Number (PCN) and KPDES number when one has been issued.

KyTC BMP Plan for Project PCN ## - #####

Sub-Contractor Certification

The following sub-contractor shall be made aware of the BMP plan and responsible for implementation of BMPs identified in this plan as follows:

Subcontractor

Name:
Address:
Address:

Phone:

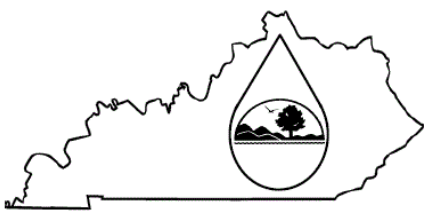
The part of BMP plan this subcontractor is responsible to implement is:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System permit that authorizes the storm water discharges, the BMP plan that has been developed to manage the quality of water to be discharged as a result of storm events associated with the construction site activity and management of non-storm water pollutant sources identified as part of this certification.

Signed _____title_____, _____
Typed or printed name¹signature

1. Sub Contractor Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.

TRANSACTION ID# 86eb68a5-8028-4ad3-9a95-e6dc43b14782


	<p style="text-align: center;">KENTUCKY POLLUTION DISCHARGE</p> <p style="text-align: center;">ELIMINATION SYSTEM (KPDES)</p> <p>Notice of Intent (NOI) for coverage of Storm Water Discharge Associated with Construction Activities Under the KPDES Storm Water General Permit KYR100000</p> <p style="text-align: center;">Click here for Instructions (Controls/KPDES_FormKYR10_Instructions.htm)</p> <p>Click here to obtain information and a copy of the KPDES General Permit. (http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf)</p> <p>(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field</p>
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Reason for Submittal:(*) Application for New Permit Cov	Agency Interest ID: Agency Interest ID	Permit Number:(✓) KPDES Permit Number
If change to existing permit coverage is requested, describe the changes for which modification of coverage is being sought:(✓) 		
ELIGIBILITY: Stormwater discharges associated with construction activities disturbing individually one (1) acre or more, including, in the case of a common plan of development, contiguous construction activities that cumulatively equal one (1) acre or more of disturbance.		
EXCLUSIONS: The following are excluded from coverage under this general permit: 1) Are conducted at or on properties that have obtained an individual KPDES permit for the discharge of other wastewaters which requires the development and implementation of a Best Management Practices (BMP) plan; 2) Any operation that the DOW determines an individual permit would better address the discharges from that operation; 3) Any project that discharges to an Impaired Water listed in the most recent Integrated Report, §305(b) as impaired for sediment and for which an approved TMDL has been developed.		
SECTION I -- FACILITY OPERATOR INFORMATION (PERMITTEE)		
Company Name:(✓) KYTC District 6	First Name:(✓) First Name	M.I.: M Last Name:(✓) Last Name
Mailing Address:(*) 421 Buttermilk Pike	City:(*) Covington	State:(*) Kentucky Zip:(*) 41017
eMail Address:(*) Robert.Yeager@ky.gov	Business Phone:(*) 859.341.2700	Alternate Phone: Phone
SECTION II -- GENERAL SITE LOCATION INFORMATION		
Project Name:(*) AA Highway Connector Road	Status of Owner/Operator(*) State Government	SIC Code(*) 1611 Highway and S
Company Name:(✓) KY Transportation Cabinet	First Name:(✓) First Name	M.I.: M Last Name:(✓) Last Name
Site Physical Address:(*) AA Highway/I-275 Connector-new road		

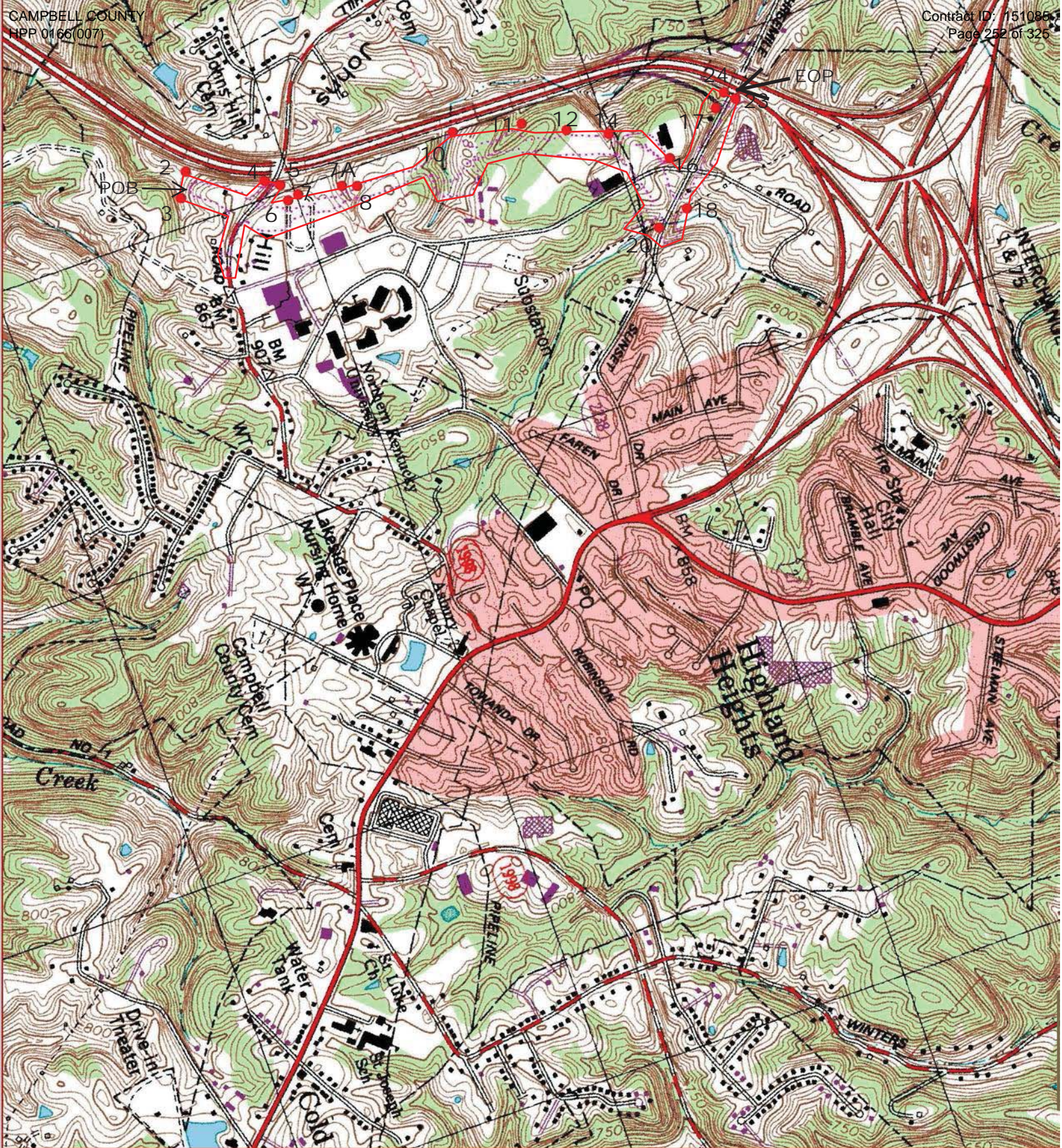
City:(*) Highland Heights		State:(*) Kentucky	Zip:(*) 41076
County:(*) Campbell	Latitude(decimal degrees)(*)DMS to DD Converter (http://transition.fcc.gov/mb/audio/bickel/DDDDMMSS-decimal.html) 39.034944		Longitude(decimal degrees)(*) -84.468806

SECTION III -- SPECIFIC SITE ACTIVITY INFORMATION ?	
Project Description:(*) Construct a new connector road from just south of John's Hill Road (KY 2345) to Three-Mile Road (KY 2238) ne:	
a. For single projects provide the following information	
Total Number of Acres in Project:(√) 49.53	Total Number of Acres Disturbed:(√) 44.29
Anticipated Start Date:(√) 1/1/2016	Anticipated Completion Date:(√) 12/31/2018
b. For common plans of development provide the following information	
Total Number of Acres in Project:(√) # Acre(s)	Total Number of Acres Disturbed:(√) # Acre(s)
Number of individual lots in development, if applicable:(√) # lot(s)	Number of lots in development:(√) # lot(s)
Total acreage of lots intended to be developed:(√) Project Acres	Number of acres intended to be disturbed at any one time:(√) Disturbed Acres
Anticipated Start Date:(√)	Anticipated Completion Date:(√)
List Building Contractor(s) at the time of Application:(*) + Company Name	

SECTION IV -- IF THE PERMITTED SITE DISCHARGES TO A WATER BODY THE FOLLOWING INFORMATION IS REQUIRED ?						
Discharge Point(s):						
	Unnamed Tributary?	Latitude	Longitude	Receiving Water Name		
1		39.027463	-84.470938	Pooles Creek	Delete	
2	No	39.027920	-84.471830	Pooles Creek	Delete	
3		39.029925	-84.470391	Pooles Creek	Delete	
4		39.030208	-84.470292	Pooles Creek	Delete	
5		39.030358	-84.469614	Pooles Creek	Delete	
6		39.030650	-84.469653	Pooles Creek	Delete	
7		39.031870	-84.469443	Pooles Creek	Delete	
8		39.032251	-84.469215	Pooles Creek	Delete	
9		39.035343	-84.469908	Pooles Creek	Delete	
10		39.037097	-84.469308	Pooles Creek	Delete	

SECTION V -- IF THE PERMITTED SITE DISCHARGES TO A MS4 THE FOLLOWING INFORMATION IS REQUIRED 			
Name of MS4: <div>Sanitation District No.1 of Northern Kentucky-HIGHLAND HEIGHTS</div>			
Date of application/notification to the MS4 for construction site permit coverage: <div>Date</div>		Discharge Point(s):(*) <div><div><div>Latitude</div><div>Longitude</div><div></div></div><div>+ <div></div></div></div>	
SECTION VI -- WILL THE PROJECT REQUIRE CONSTRUCTION ACTIVITIES IN A WATER BODY OR THE RIPARIAN ZONE?			
Will the project require construction activities in a water body or the riparian zone?:(*)		<div>No</div>	
If Yes, describe scope of activity: (✓)		<div>describe scope of activity</div>	
Is a Clean Water Act 404 permit required?:(*)		<div>No</div>	
Is a Clean Water Act 401 Water Quality Certification required?:(*)		<div>No</div>	
SECTION VII -- NOI PREPARER INFORMATION			
First Name:(*) <div>First Name</div>	M.I.: <div>M</div>	Last Name:(*) <div>Last Name</div>	Company Name:(*) <div>KY Transportation Cabinet</div>
Mailing Address:(*) <div>Mailing Address</div>	City:(*) <div>City</div>	State:(*) <div>Kentucky</div>	Zip:(*) <div>Zip</div>
eMail Address:(*) <div>eMail Address</div>		Business Phone:(*) <div>Phone</div>	Alternate Phone: <div>Phone</div>
SECTION VIII -- ATTACHMENTS			
Facility Location Map:(*)		<div>Upload file</div>	
Supplemental Information:		<div>Upload file</div>	
SECTION IX -- CERTIFICATION			
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.			
Signature:(*) <div>Robert Hans</div>		Title:(*) <div>Chief District Engineer-KYTC District 6</div>	
First Name:(*) <div>Robert</div>	M.I.: <div>MI</div>	Last Name:(*) <div>Hans</div>	
eMail Address:(*) <div>robert.hans@ky.gov</div>	Business Phone:(*) <div>859.341.2700</div>	Alternate Phone: <div>Phone</div>	Signature Date:(*)

Date	
<div>Click to Save Values for Future Retrieval Click to Submit to DEP</div>	



Point of Olechar'ae	LATITUOE	LONGITLIE
POB	39.027222	-84.471389
2	39.02792037	-84.47182993
3	39.02746258	-84.47093842
4	39.02992511	-84.47039136
5	39.03020766	-84.47029229
6	39.03035830	-84.46961388
7	39.03064951	-84.46965345
7A	39.03186902	-84.46944257
8	39.03225110	-84.46921468

Point of orscnrae	LATITLIE	LOIGITUOE
10	39.03534254	-84.46990755
11	39.03709716	-84.46930765
12	39.03841674	-84.46851530
14	39.03958802	-84.46786845
16	39.04082157	-84.46626242
17	39.04266378	-84.46746856
18	39.04077811	-84.46436584
20	39.03993176	-84.46402629
23	39.04340885	-84.46732975

Point of orscnrae	LATITUDE	LONGITLIE
24	39.04332425	-84.46746085
EOP	39.043056	-84.466944



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

July 30, 2014

Robert Hans
I 275 Connector - Campbell Co
421 Buttermilk Pike
Covington, KY 41017

Re: KYR10 Coverage Acknowledgment
KPDES No.: [KYR10I661](#)
[NKU Connector Road](#)
Permit Type: [Construction](#)
AI ID: [123304](#)
[Campbell County, Kentucky](#)

Dear [Robert Hans](#):

The discharges associated with the Notice of Intent you submitted have been approved for coverage under the "Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Stormwater Discharges Associated with Construction Activities (KYR10)" permit. This coverage becomes effective the date of this correspondence and will remain effective until the general permit expires or the Division of Water revokes coverage. During this period of coverage all discharges shall comply with the conditions of the applicable general permit. A copy of the general permit the operator is now covered by can be found on our website: <http://water.ky.gov>.

Any questions concerning the general permit and its requirements should be directed to me at (502) 564-3410.

Facility Site: 39.034944, -84.468806

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn Hokanson", with a long horizontal line extending to the right.

Shawn Hokanson
Surface Water Permits Branch
Division of Water

PART II

SPECIFICATIONS AND STANDARD DRAWINGS

SPECIFICATIONS REFERENCE

Any reference in the plans or proposal to previous editions of the *Standard Specifications for Road and Bridge Construction* and *Standard Drawings* are superseded by *Standard Specifications for Road and Bridge Construction, Edition of 2012* and *Standard Drawings, Edition of 2012 with the 2012 Revision*.

**Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the July 31, 2015 Letting**

Subsection:	102.15 Process Agent.
Revision:	Replace the 1st paragraph with the following: Every corporation doing business with the Department shall submit evidence of compliance with KRS Sections 14A.4-010, 271B.11-010, 271B.11-070, 271B.11-080, 271B.5-010 and 271B.16-220, and file with the Department the name and address of the process agent upon whom process may be served.
Subsection:	105.13 Claims Resolution Process.
Revision:	Delete all references to TC 63-34 and TC 63-44 from the subsection as these forms are no longer available through the forms library and are forms generated within the AASHTO SiteManager software.
Subsection:	108.03 Preconstruction Conference.
Revision:	Replace 8) Staking with the following: 8) Staking (designated by a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
Subsection:	109.07.02 Fuel.
Revision:	Revise item Crushed Aggregate Used for Embankment Stabilization to the following: Crushed Aggregate Used for Stabilization of Unsuitable Materials Used for Embankment Stabilization
	Delete the following item from the table. Crushed Sandstone Base (Cement Treated)
Subsection:	110.02 Demobilization.
Revision:	Replace the first part of the first sentence of the second paragraph with the following: Perform all work and operations necessary to accomplish final clean-up as specified in the first paragraph of Subsection 105.12;
Subsection:	112.03.12 Project Traffic Coordinator (PTC).
Revision:	Replace the last paragraph of this subsection with the following: Ensure the designated PTC has sufficient skill and experience to properly perform the task assigned and has successfully completed the qualification courses.
Subsection:	112.04.18 Diversions (By-Pass Detours).
Revision:	Insert the following sentence after the 2nd sentence of this subsection. The Department will not measure temporary drainage structures for payment when the contract documents provide the required drainage opening that must be maintained with the diversion. The temporary drainage structures shall be incidental to the construction of the diversion. If the contract documents fail to provide the required drainage opening needed for the diversion, the cost of the temporary drainage structure will be handled as extra work in accordance with section 109.04.
Subsection:	201.03.01 Contractor Staking.
Revision:	Replace the first paragraph with the following: Perform all necessary surveying under the general supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.

Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the July 31, 2015 Letting

Subsection:	201.04.01 Contractor Staking.
Revision:	Replace the last sentence of the paragraph with the following: Complete the general layout of the project under the supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
Subsection:	206.04.01 Embankment-in-Place.
Revision:	Replace the fourth paragraph with the following: The Department will not measure suitable excavation included in the original plans that is disposed of for payment and will consider it incidental to Embankment-in-Place.
Subsection:	208.02.01 Cement.
Revision:	Replace paragraph with the following: Select Type I or Type II cement conforming to Section 801. Use the same type cement throughout the work.
Subsection:	208.03.06 Curing and Protection.
Revision:	Replace the fourth paragraph with the following: Do not allow traffic or equipment on the finished surface until the stabilized subgrade has cured for a total of 7-days with an ambient air temperature above 40 degrees Fahrenheit. A curing day consists of a continuous 24-hour period in which the ambient air temperature does not fall below 40 degrees Fahrenheit. Curing days will not be calculated consecutively, but must total seven (7) , 24-hour days with the ambient air temperature remaining at or above 40 degrees Fahrenheit before traffic or equipment will be allowed to traverse the stabilized subgrade. The Department may allow a shortened curing period when the Contractor requests. The Contractor shall give the Department at least 3 day notice of the request for a shortened curing period. The Department will require a minimum of 3 curing days after final compaction. The Contractor shall furnish cores to the treated depth of the roadbed at 500 feet intervals for each lane when a shortened curing time is requested. The Department will test cores using an unconfined compression test. Roadbed cores must achieve a minimum strength requirement of 80 psi.
Subsection:	208.03.06 Curing and Protection.
Revision:	Replace paragraph eight with the following: At no expense to the Department, repair any damage to the subgrade caused by freezing.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Revision:	Revise Seed Mix Type I to the mixture shown below: 50% Kentucky 31 Tall Fescue (Festuca arundinacea) 35% Hard Fescue (Festuca (Festuca longifolia) 10% Ryegrass, Perennial (Lolium perenne) 5% White Dutch Clover (Trifolium repens)
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	2)
Revision:	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 4, 5, 6, and 7. Apply seed mix Type II at a minimum application rate of 100 pounds per acre. If adjacent to a golf course replace the crown vetch with Kentucky 31 Tall Fescue.

**Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the July 31, 2015 Letting**

Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	3)
Revision:	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 1, 2, 3, 8, 9, 10, 11, and 12. Apply seed mix Type III at a minimum application rate of 100 pounds per acre. If adjacent to crop land or golf course, replace the Sericea Lespedeza with Kentucky 31 Fescue.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	Delete the first sentence of the section.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	Replace the second and third sentence of the section with the following: Prepare a seedbed and apply an initial fertilizer that contains a minimum of 100 pounds of nitrogen, 100 pounds of phosphate, and 100 pounds of potash per acre. Apply agricultural limestone to the seedbed when the Engineer determines it is needed. When required, place agricultural limestone at a rate of 3 tons per acre.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Top Dressing.
Revision:	Change the title of part to D) Fertilizer.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	Replace the first paragraph with the following: Apply fertilizer at the beginning of the seeding operation and after vegetation is established. Use fertilizer delivered to the project in bags or bulk. Apply initial fertilizer to all areas prior to the seeding or sodding operation at the application rate specified in 212.03.03 B). Apply 20-10-10 fertilizer to the areas after vegetation has been established at a rate of 11.5 pounds per 1,000 square feet. Obtain approval from the Engineer prior to the 2nd fertilizer application. Reapply fertilizer to any area that has a streaked appearance. The reapplication shall be at no additional cost to the Department. Re-establish any vegetation severely damaged or destroyed because of an excessive application of fertilizer at no cost to the Department.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	Delete the second paragraph.
Subsection:	212.04.04 Agricultural Limestone.
Revision:	Replace the entire section with the following: The Department will measure the quantity of agricultural limestone in tons.
Subsection:	212.04.05 Fertilizer.
Revision:	Replace the entire section with the following: The Department will measure fertilizer used in the seeding or sodding operations for payment. The Department will measure the quantity by tons.

**Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the July 31, 2015 Letting**

Subsection:	212.05 PAYMENT.		
Revision:	Delete the following item code:		
	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
	05966	Topdressing Fertilizer	Ton
Subsection:	212.05 PAYMENT.		
Revision:	Add the following pay items:		
	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
	05963	Initial Fertilizer	Ton
	05964	20-10-10 Fertilizer	Ton
	05992	Agricultural Limestone	Ton
Subsection:	213.03.02 Progress Requirements.		
Revision:	Replace the last sentence of the third paragraph with the following: Additionally, the Department will apply a penalty equal to the liquidated damages when all aspects of work are not coordinated in an acceptable manner within 7 calendar days after written notification.		
Subsection:	213.03.05 Temporary Control Measures.		
Part:	E) Temporary Seeding and Protection.		
Revision:	Delete the second sentence of the first paragraph.		
Subsection:	304.02.01 Physical Properties.		
Table:	Required Geogrid Properties		
Revision:	Replace all references to Test Method "GRI-GG2-87" with ASTM D 7737.		
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.		
Part:	B) Sampling.		
Revision:	Replace the second sentence with the following: The Department will determine when to obtain the quality control samples using the random-number feature of the mix design submittal and approval spreadsheet. The Department will randomly determine when to obtain the verification samples required in Subsections 402.03.03 and 402.03.04 using the Asphalt Mixture Sample Random Tonnage Generator.		
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.		
Part:	D) Testing Responsibilities.		
Number:	3) VMA.		
Revision:	Add the following paragraph below Number 3) VMA: Retain the AV/VMA specimens and one additional corresponding G _{mm} sample for 5 working days for mixture verification testing by the Department. For Specialty Mixtures, retain a mixture sample for 5 working days for mixture verification testing by the Department. When the Department's test results do not verify that the Contractor's quality control test results are within the acceptable tolerances according to Subsection 402.03.03, retain the samples and specimens from the affected subplot(s) for the duration of the project.		
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.		
Part:	D) Testing Responsibilities.		
Number:	4) Density.		
Revision:	Replace the second sentence of the Option A paragraph with the following: Perform coring by the end of the following work day.		

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Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	D) Testing Responsibilities.
Number:	5) Gradation.
Revision:	Delete the second paragraph.
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	H) Unsatisfactory Work.
Number:	1) Based on Lab Data.
Revision:	Replace the second paragraph with the following: When the Engineer determines that safety concerns or other considerations prohibit an immediate shutdown, continue work and the Department will make an evaluation of acceptability according to Subsection 402.03.05.
Subsection:	402.03.03 Verification.
Revision:	Replace the first paragraph with the following: 402.03.03 Mixture Verification. For volumetric properties, the Department will perform a minimum of one verification test for AC, AV, and VMA according to the corresponding procedures as given in Subsection 402.03.02. The Department will randomly determine when to obtain the verification sample using the Asphalt Mixture Sample Random Tonnage Generator. For specialty mixtures, the Department will perform one AC and one gradation determination per lot according to the corresponding procedures as given in Subsection 402.03.02. However, Department personnel will not perform AC determinations according to KM 64-405. The Contractor will obtain a quality control sample at the same time the Department obtains the mixture verification sample and perform testing according to the procedures given in Subsection 402.03.02. If the Contractor's quality control sample is verified by the Department's test results within the tolerances provided below, the Contractor's sample will serve as the quality control sample for the affected subplot. The Department may perform the mixture verification test on the Contractor's equipment or on the Department's equipment.
Subsection:	402.03.03 Verification.
Part:	A) Evaluation of Subplot(s) Verified by Department.
Revision:	Replace the third sentence of the second paragraph with the following: When the paired t -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Subplots Not Verified by Department.
Revision:	Replace the third sentence of the first paragraph with the following: When differences between test results are not within the tolerances listed below, the Department will resolve the discrepancy according to Subsection 402.03.05.

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Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Sublots Not Verified by Department.
Revision:	Replace the third sentence of the second paragraph with the following: When the <i>F</i> -test or <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
Subsection:	402.03.03 Verification.
Part:	C) Test Data Patterns.
Revision:	Replace the second sentence with the following: When patterns indicate substantial differences between the verified and non-verified sublots, the Department will perform further comparative testing according to subsection 402.03.05.
Subsection:	402.03 CONSTRUCTION.
Revision:	Add the following subsection: 402.03.04 Testing Equipment and Technician Verification. For mixtures with a minimum quantity of 20,000 tons and for every 20,000 tons thereafter, the Department will obtain an additional verification sample at random using the Asphalt Mixture Sample Random Tonnage Generator in order to verify the integrity of the Contractor's and Department's laboratory testing equipment and technicians. The Department will obtain a mixture sample of at least 150 lb at the asphalt mixing plant according to KM 64-425 and split it according to AASHTO R 47. The Department will retain one split portion of the sample and provide the other portion to the Contractor. At a later time convenient to both parties, the Department and Contractor will simultaneously reheat the sample to the specified compaction temperature and test the mixture for AV and VMA using separate laboratory equipment according to the corresponding procedures given in Subsection 402.03.02. The Department will evaluate the differences in test results between the two laboratories. When the difference between the results for AV or VMA is not within ± 2.0 percent, the Department will investigate and resolve the discrepancy according to Subsection 402.03.05.
Subsection:	402.03.04 Dispute Resolution.
Revision:	Change the subsection number to 402.03.05.
Subsection:	402.05 PAYMENT.
Part:	Lot Pay Adjustment Schedule Compaction Option A Base and Binder Mixtures
Table:	AC
Revision:	Replace the Deviation from JMF(%) that corresponds to a Pay Value of 0.95 to ± 0.6 .
Subsection:	403.02.10 Material Transfer Vehicle (MTV).
Revision:	Replace the first sentence with the following: In addition to the equipment specified above, provide a MTV with the following minimum characteristics:
Subsection:	412.02.09 Material Transfer Vehicle (MTV).
Revision:	Replace the paragraph with the following: Provide and utilize a MTV with the minimum characteristics outlined in section 403.02.10.

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Subsection:	412.03.07 Placement and Compaction.
Revision:	Replace the first paragraph with the following: Use a MTV when placing SMA mixture in the driving lanes. The MTV is not required on ramps and/or shoulders unless specified in the contract. When the Engineer determines the use of the MTV is not practical for a portion of the project, the Engineer may waive its requirement for that portion of pavement by a letter documenting the waiver.
Subsection:	412.04 MEASUREMENT.
Revision:	Add the following subsection: 412.04.03. Material Transfer Vehicle (MTV). The Department will not measure the MTV for payment and will consider its use incidental to the asphalt mixture.
Subsection:	501.03.05 Weather Limitations and Protection.
Revision:	Replace the reference to Subsection 501.03.19 in Paragraph 5, with Subsection 501.03.20.
Subsection:	501.03.19 Surface Tolerances and Testing Surface.
Part:	B) Ride Quality.
Revision:	Add the following to the end of the first paragraph: The Department will specify if the ride quality requirements are Category A or Category B when ride quality is specified in the Contract. Category B ride quality requirements shall apply when the Department fails to classify which ride quality requirement will apply to the Contract.
Subsection:	603.03.06 Cofferdams.
Revision:	Replace the seventh sentence of paragraph one with the following: Submit drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
Subsection:	605.03.04 Tack Welding.
Revision:	Insert the subsection and the following: 605.03.04 Tack Welding. The Department does not allow tack welding.
Subsection:	606.03.17 Special Requirements for Latex Concrete Overlays.
Part:	A) Existing Bridges and New Structures.
Number:	1) Prewetting and Grout-Bond Coat.
Revision:	Add the following sentence to the last paragraph: Do not apply a grout-bond coat on bridge decks prepared by hydrodemolition.
Subsection:	609.03 Construction.
Revision:	Replace Subsection 609.03.01 with the following: 609.03.01 A) Swinging the Spans. Before placing concrete slabs on steel spans or precast concrete release the temporary erection supports under the bridge and swing the span free on its supports. 609.03.01 B) Lift Loops. Cut all lift loops flush with the top of the precast beam once the beam is placed in the final location and prior to placing steel reinforcement. At locations where lift loops are cut, paint the top of the beam with galvanized or epoxy paint.

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Subsection:	611.03.02 Precast Unit Construction.
Revision:	Replace the first sentence of the subsection with the following: Construct units according to ASTM C1577, replacing Table 1 (Design Requirements for Precast Concrete Box Sections Under Earth, Dead and HL-93 Live Load Conditions) with KY Table 1 (Precast Culvert KYHL-93 Design Table) , and Section 605 with the following exceptions and additions:
Subsection:	613.03.01 Design.
Number:	2)
Revision:	Replace "AASHTO Standard Specifications for Highway Bridges" with "AASHTO LRFD Bridge Design Specifications"
Subsection:	615.06.02
Revision:	Add the following sentence to the end of the subsection. The ends of units shall be normal to walls and centerline except exposed edges shall be beveled $\frac{3}{4}$ inch.
Subsection:	615.06.03 Placement of Reinforcement in Precast 3-Sided Units.
Revision:	Replace the reference of 6.6 in the section to 615.06.06.
Subsection:	615.06.04 Placement of Reinforcement for Precast Endwalls.
Revision:	Replace the reference of 6.7 in the section to 615.06.07.
Subsection:	615.06.06 Laps, Welds, and Spacing for Precast 3-Sided Units.
Revision:	Replace the subsection with the following: Tension splices in the circumferential reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be no less than 2 inches and no more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.
Subsection:	615.06.07 Laps, Welds, and Spacing for Precast Endwalls.
Revision:	Replace the subsection with the following: Splices in the reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. The spacing center-to-center of the wire fabric sheet shall not be less than 2 inches or more than 8 inches.

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Subsection:	615.08.01 Type of Test Specimen.
Revision:	Replace the subsection with the following: Start-up slump, air content, unit weight, and temperature tests will be performed each day on the first batch of concrete. Acceptable start-up results are required for production of the first unit. After the first unit has been established, random acceptance testing is performed daily for each 50 yd ³ (or fraction thereof). In addition to the slump, air content, unit weight, and temperature tests, a minimum of one set of cylinders shall be required each time plastic property testing is performed.
Subsection:	615.08.02 Compression Testing.
Revision:	Delete the second sentence.
Subsection:	615.08.04 Acceptability of Core Tests.
Revision:	Delete the entire subsection.
Subsection:	615.12 Inspection.
Revision:	Add the following sentences to the end of the subsection: Units will arrive at jobsite with the "Kentucky Oval" stamped on the unit which is an indication of acceptable inspection at the production facility. Units shall be inspected upon arrival for any evidence of damage resulting from transport to the jobsite.
Subsection:	701.04.16 Deduction for Pipe Deflection.
Revision:	Insert the following at the end of the paragraph: The section length is determined by the length of the pipe between joints where the failure occurred.
Subsection:	716.02.02 Paint.
Revision:	Replace sentence with the following: Conform to Section 821.
Subsection:	716.03 CONSTRUCTION.
Revision:	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,
Subsection:	716.03.02 Lighting Standard Installation.
Revision:	Replace the second sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Revision:	Replace the third sentence with the following: Orient the transformer base so the door is positioned on the side away from on-coming traffic.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Number:	1) Breakaway Installation and Requirements.
Revision:	Replace the first sentence with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	B) High Mast Installation
Revision:	Replace the first sentence with the following: Install each high mast pole as noted on plans.

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Subsection:	716.03.02 Lighting Standard Installation.																																																																
Part:	B) High Mast Installation																																																																
Number:	2) Concrete Base Installation																																																																
Revision:	Modification of Chart and succeeding paragraphs within this section:																																																																
	<table><tr><th colspan="8">Drilled Shaft Depth Data</th></tr><tr><th colspan="2">Level Ground</th><th colspan="2">3:1 Ground Slope</th><th colspan="2">2:1 Ground Slope</th><th colspan="2">1.5:1 Ground Slope ⁽²⁾</th></tr><tr><th>Soil</th><th>Rock</th><th>Soil</th><th>Rock</th><th>Soil</th><th>Rock</th><th>Soil</th><th>Rock</th></tr><tr><td>17 ft</td><td>7 ft</td><td>19 ft</td><td>7 ft</td><td>20 ft</td><td>7 ft</td><td>(1)</td><td>7 ft</td></tr><tr><th colspan="4">Steel Requirements</th><th colspan="4"></th></tr><tr><th colspan="2">Vertical Bars</th><th colspan="2">Ties or Spiral</th><th colspan="4"></th></tr><tr><th>Size</th><th>Total</th><th>Size</th><th>Spacing or Pitch</th><th colspan="4"></th></tr><tr><td>#10</td><td>16</td><td>#4</td><td>12 inch</td><th colspan="4"></th></tr></table> <p>(1): Shaft length is 22' for cohesive soil only. For cohesionless soil, contact geotechnical branch for design.</p> <p>(2): Do not construct high mast drilled shafts on ground slopes steeper than 1.5:1 without the approval of the Division of Traffic.</p> <p>If rock is encountered during drilling operations and confirmed by the engineer to be of sound quality, the shaft is only required to be further advanced into the rock by the length of rock socket shown in the table. The total length of the shaft need not be longer than that of soil alone. Both longitudinal rebar length and number of ties or spiral length shall be adjusted accordingly.</p> <p>If a shorter depth is desired for the drilled shaft, the contractor shall provide, for the state's review and approval, a detailed column design with individual site specific soil and rock analysis performed and approved by a Professional Engineer licensed in the Commonwealth of Kentucky.</p> <p>Spiral reinforcement may be substituted for ties. If spiral reinforcement is used, one and one-half closed coils shall be provided at the ends of each spiral unit. Subsurface conditions consisting of very soft clay or very loose saturated sand could result in soil parameters weaker than those assumed. Engineer shall consult with the geotechnical branch if such conditions are encountered.</p> <p>The bottom of the drilled hole shall be firm and thoroughly cleaned so no loose or compressible materials are present at the time of the concrete placement. If the drilled hole contains standing water, the concrete shall be placed using a tremie to displace water. Continuous concrete flow will be required to insure full displacement of any water.</p> <p>The reinforcement and anchor bolts shall be adequately supported in the proper positions so no movement occurs during concrete placement. Welding of anchor bolts to the reinforcing cage is unacceptable, templates shall be used. Exposed portions of the foundation shall be formed to create a smooth finished surface. All forming shall be removed upon completion of foundation construction.</p>	Drilled Shaft Depth Data								Level Ground		3:1 Ground Slope		2:1 Ground Slope		1.5:1 Ground Slope ⁽²⁾		Soil	Rock	Soil	Rock	Soil	Rock	Soil	Rock	17 ft	7 ft	19 ft	7 ft	20 ft	7 ft	(1)	7 ft	Steel Requirements								Vertical Bars		Ties or Spiral						Size	Total	Size	Spacing or Pitch					#10	16	#4	12 inch				
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Subsection:	716.03.03 Trenching.																																																																
Part:	A) Trenching of Conduit for Highmast Ducted Cables.																																																																
Revision:	Add the following after the first sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.																																																																

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Subsection:	716.03.03 Trenching.
Part:	B) Trenching of Conduit for Non-Highmast Cables.
Revision:	Add the following after the second sentence: If depths greater than 24 inches are necessary for either situation listed previously, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
Subsection:	716.03.10 Junction Boxes.
Revision:	Replace subsection title with the following: Electrical Junction Box.
Subsection:	716.04.07 Pole with Secondary Control Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure mounting the cabinet to the pole, backfilling, restoration, any necessary hardware to anchor pole, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breaker, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
Subsection:	716.04.08 Lighting Control Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure constructing the concrete base, excavation, backfilling, restoration, any necessary anchors, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breakers, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
Subsection:	716.04.09 Luminaire.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.10 Fused Connector Kits.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.13 Junction Box.
Revision:	Replace the subsection title with the following: Electrical Junction Box Type Various.
Subsection:	716.04.13 Junction Box.
Part:	A) Junction Electrical.
Revision:	Rename A) Junction Electrical to the following: A) Electrical Junction Box.
Subsection:	716.04.14 Trenching and Backfilling.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.

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Subsection:	716.04.18 Remove Lighting.															
Revision:	Replace the paragraph with the following: The Department will measure the quantity as a lump sum for the removal of lighting equipment. The Department will not measure the disposal of all equipment and materials off the project by the contractor. The Department also will not measure the transportation of the materials and will consider them incidental to this item of work.															
Subsection:	716.04.20 Bore and Jack Conduit.															
Revision:	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.															
Subsection:	716.05 PAYMENT.															
Revision:	Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following: <table><tr><td><u>Code</u></td><td><u>Pay Item</u></td><td><u>Pay Unit</u></td></tr><tr><td>04810</td><td>Electrical Junction Box</td><td>Each</td></tr><tr><td>04811</td><td>Electrical Junction Box Type B</td><td>Each</td></tr><tr><td>20391NS835</td><td>Electrical Junction Box Type A</td><td>Each</td></tr><tr><td>20392NS835</td><td>Electrical Junction Box Type C</td><td>Each</td></tr></table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	04810	Electrical Junction Box	Each	04811	Electrical Junction Box Type B	Each	20391NS835	Electrical Junction Box Type A	Each	20392NS835	Electrical Junction Box Type C	Each
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20392NS835	Electrical Junction Box Type C	Each														
Subsection:	723.02.02 Paint.															
Revision:	Replace sentence with the following: Conform to Section 821.															
Subsection:	723.03 CONSTRUCTION.															
Revision:	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,															
Subsection:	723.03.02 Poles and Bases Installation.															
Revision:	Replace the first sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	A) Steel Strain and Mastarm Poles Installation															
Revision:	Replace the second paragraph with the following: For concrete base installation, see Section 716.03.02, B), 2), Paragraphs 2-7. Drilled shaft depth shall be based on the soil conditions encountered during drilling and slope condition at the site. Refer to the design chart below:															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	B) Pedestal or Pedestal Post Installation.															
Revision:	Replace the fourth sentence of the paragraph with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.															

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Subsection:	723.03.03 Trenching.
Part:	A) Under Roadway.
Revision:	Add the following after the second sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain either required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
Subsection:	723.03.11 Wiring Installation.
Revision:	Add the following sentence between the fifth and sixth sentences: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
Subsection:	723.03.12 Loop Installation.
Revision:	Replace the fourth sentence of the 2nd paragraph with the following: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
Subsection:	723.04.02 Junction Box.
Revision:	Replace subsection title with the following: Electrical Junction Box Type Various.
Subsection:	723.04.03 Trenching and Backfilling.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.
Subsection:	723.04.10 Signal Pedestal.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, specified conduits, fittings, ground rod, ground wire, backfilling, restoring disturbed areas, or other necessary hardware and will consider them incidental to this item of work.
Subsection:	723.04.15 Loop Saw Slot and Fill.
Revision:	Replace the second sentence with the following: The Department will not measure sawing, cleaning and filling induction loop saw slot, loop sealant, backer rod, and grout and will consider them incidental to this item of work.
Subsection:	723.04.16 Pedestrian Detector.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished, installed and connected to pole/pedestal. The Department will not measure installing R10-3e (with arrow) sign, furnishing and installing mounting hardware for sign and will consider them incidental to this item of work.
Subsection:	723.04.18 Signal Controller- Type 170.
Revision:	Replace the second sentence with the following: The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure furnishing and connecting the induction of loop amplifiers, pedestrian isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.

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Subsection:	723.04.20 Install Signal Controller - Type 170.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed. The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, and excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure connecting the induction loop amplifiers, pedestrian, isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.
Subsection:	723.04.22 Remove Signal Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as a lump sum removal of signal equipment. The Department will not measure the return of control equipment and signal heads to the Department of Highways as directed by the District Traffic Engineer. The Department also will not measure the transportation of materials of the disposal of all other equipment and materials off the project by the contractor and will consider them incidental to this item of work.
Subsection:	723.04.28 Install Pedestrian Detector Audible.
Revision:	Replace the second sentence with the following: The Department will not measure installing sign R10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.29 Audible Pedestrian Detector.
Revision:	Replace the second sentence with the following: The Department will not measure furnishing and installing the sign R10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.30 Bore and Jack Conduit.
Revision:	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.
Subsection:	723.04.31 Install Pedestrian Detector.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed and connected to pole/pedestal. The Department will not measure installing sign R 10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.32 Install Mast Arm Pole.
Revision:	Replace the second sentence with the following: The Department will not measure arms, signal mounting brackets, anchor bolts, or any other necessary hardware and will consider them incidental to this item of work.
Subsection:	723.04.33 Pedestal Post.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, conduit, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.

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Subsection:	723.04.36 Traffic Signal Pole Base.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, reinforcing steel, anchor bolts, specified conduits, ground rods, ground wires, backfilling, or restoration and will consider them incidental to this item of work.															
Subsection:	723.04.37 Install Signal Pedestal.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
Subsection:	723.04.38 Install Pedestal Post.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
Subsection:	723.05 PAYMENT.															
Revision:	Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following: <table><tr><td><u>Code</u></td><td><u>Pay Item</u></td><td><u>Pay Unit</u></td></tr><tr><td>04810</td><td>Electrical Junction Box</td><td>Each</td></tr><tr><td>04811</td><td>Electrical Junction Box Type B</td><td>Each</td></tr><tr><td>20391NS835</td><td>Electrical Junction Box Type A</td><td>Each</td></tr><tr><td>20392NS835</td><td>Electrical Junction Box Type C</td><td>Each</td></tr></table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	04810	Electrical Junction Box	Each	04811	Electrical Junction Box Type B	Each	20391NS835	Electrical Junction Box Type A	Each	20392NS835	Electrical Junction Box Type C	Each
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>														
04810	Electrical Junction Box	Each														
04811	Electrical Junction Box Type B	Each														
20391NS835	Electrical Junction Box Type A	Each														
20392NS835	Electrical Junction Box Type C	Each														
Subsection:	804.01.02 Crushed Sand.															
Revision:	Delete last sentence of the section.															
Subsection:	804.01.06 Slag.															
Revision:	Add subsection and following sentence. Provide blast furnace slag sand where permitted. The Department will allow steel slag sand only in asphalt surface applications.															
Subsection:	804.04 Asphalt Mixtures.															
Revision:	Replace the subsection with the following: Provide natural, crushed, conglomerate, or blast furnace slag sand, with the addition of filler as necessary, to meet gradation requirements. The Department will allow any combination of natural, crushed, conglomerate or blast furnace slag sand when the combination is achieved using cold feeds at the plant. The Engineer may allow other fine aggregates.															
Subsection:	806.03.01 General Requirements.															
Revision:	Replace the second sentence of the paragraph with the following: Additionally, the material must have a minimum solubility of 99.0 percent when tested according to AASHTO T 44 and PG 76-22 must exhibit a minimum recovery of 60 percent, with a J _{NR} (nonrecoverable creep compliance) between 0.1 and 0.5, when tested according to AASHTO TP 70.															

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Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Revision:	Replace the Elastic Recovery, % ⁽³⁾ (AASHTO T301) and all corresponding values in the table with the following:						
	<u>Test</u>	<u>Specification</u>	<u>100% Pay</u>	<u>90% Pay</u>	<u>80% Pay</u>	<u>70% Pay</u>	<u>50% Pay</u> ⁽¹⁾
	MSCR recovery, % ⁽³⁾ (AASHTO TP 70)	60 Min.	≥58	56	55	54	<53
Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Superscript:	(3)						
Revision:	Replace ⁽³⁾ with the following: Perform testing at 64°C.						
Subsection:	813.04 Gray Iron Castings.						
Revision:	Replace the reference to "AASHTO M105" with "ASTM A48".						
Subsection:	813.09.02 High Strength Steel Bolts, Nuts, and Washers.						
Number:	A) Bolts.						
Revision:	Delete first paragraph and "Hardness Number" Table. Replace with the following: A) Bolts. Conform to ASTM A325 (AASHTO M164) or ASTM A490 (AASHTO 253) as applicable.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Third paragraph, replace the reference to "AWPA C14" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Replace the first sentence of the fourth paragraph with the following: Use any of the species of wood for round or square posts covered under AWPA U1.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Fourth paragraph, replace the reference to "AWPA C2" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Delete the second sentence of the fourth paragraph.						
Subsection:	814.05.02 Composite Plastic.						
Revision:	1) Add the following to the beginning of the first paragraph: Select composite offset blocks conforming to this section and assure blocks are from a manufacturer included on the Department's List of Approved Materials. 2) Delete the last paragraph of the subsection.						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	First paragraph, replace the reference to "AWPA C5" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	Delete the second sentence of the first paragraph.						
Subsection:	818.07 Preservative Treatment.						
Revision:	First paragraph, replace all references to "AWPA C14" with "AWPA U1, Section A".						

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Subsection:	834.14 Lighting Poles.
Revision:	Replace the first sentence with the following: Lighting pole design shall be in accordance with loading and allowable stress requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims, with the exception of the following: The Cabinet will waive the requirement stated in the first sentence of Section 5.14.6.2 – Reinforced Holes and Cutouts for high mast poles (only). The minimum diameter at the base of the pole shall be 22 inches for high mast poles (only).
Subsection:	834.14.03 High Mast Poles.
Revision:	Remove the second and fourth sentence from the first paragraph.
Subsection:	834.14.03 High Mast Poles.
Revision:	Replace the third paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
Subsection:	834.14.03 High Mast Poles.
Revision:	Replace paragraph six with the following: Provide a pole section that conforms to ASTM A 595 grade A with a minimum yield strength of 55 KSI or ASTM A 572 with a minimum yield strength of 55 KSI. Use tubes that are round or 16 sided with a four inch corner radius, have a constant linear taper of .144 in/ft and contain only one longitudinal seam weld. Circumferential welded tube butt splices and laminated tubes are not permitted. Provide pole sections that are telescopically slip fit assembled in the field to facilitate inspection of interior surface welds and the protective coating. The minimum length of the telescopic slip splices shall be 1.5 times the inside diameter of the exposed end of the female section. Use longitudinal seam welds as commended in Section 5.15 of the AASHTO 2013 Specifications. The thickness of the transverse base shall not be less than 2 inches. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration groove weld with backup bar. The handhole cover shall be removable from the handhole frame. One the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM A 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7-guage stainless steel to provide adjustability to insure weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube of the pole but needs to be at least 15 inches. Provide products that are hot-dip galvanized to the requirements of either ASTM A123 (fabricated products) or ASTM A 153 (hardware items).
Subsection:	834.16 ANCHOR BOLTS.
Revision:	Insert the following sentence at the beginning of the paragraph: The anchor bolt design shall follow the NCHRP Report 494 Section 2.4 and NCHRP 469 Appendix A Specifications.

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Subsection:	834.17.01 Conventional.
Revision:	Add the following sentence after the second sentence: Provide a waterproof sticker mounted on the bottom of the housing that is legible from the ground and indicates the wattage of the fixture by providing the first two numbers of the wattage.
Subsection:	834.21.01 Waterproof Enclosures.
Revision:	Replace the last five sentences in the second paragraph with the following sentences: Provide a cabinet door with a louvered air vent, filter-retaining brackets and an easy to clean metal filter. Provide a cabinet door that is keyed with a factory installed standard no. 2 corbin traffic control key. Provide a light fixture with switch and bulb. Use a 120-volt fixture and utilize a L.E.D. bulb (equivalent to 60 watts minimum). Fixture shall be situated at or near the top of the cabinet and illuminate the contents of the cabinet. Provide a 120 VAC GFI duplex receptacle in the enclosure with a separate 20 amp breaker.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the first sentence of the first paragraph with the following: Pole diameter and wall thickness shall be calculated in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
Subsection:	835.07 Traffic Poles.
Revision:	*Replace the first sentence of the fourth paragraph with the following: Ensure transverse plates have a thickness ≥ 2 inches. *Add the following sentence to the end of the fourth paragraph: The bottom pole diameter shall not be less than 16.25 inches.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the third sentence of the fifth paragraph with the following: For anchor bolt design, pole forces shall be positioned in such a manner to maximize the force on any individual anchor bolt regardless of the actual anchor bolt orientation with the pole.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the first and second sentence of the sixth paragraph with the following: The pole handhole shall be 25 inches by 6.5 inches. The handhole cover shall be removable from the handhole frame. On the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7 gauge stainless steel to provide adjustability to insure a weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube but needs to be at least 12 inches.

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Subsection:	835.07 Traffic Poles.		
Revision:	*Replace the first sentence of the last paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky. *Replace the third sentence of the last paragraph with the following: All tables referenced in 835.07 are found in the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.		
Subsection:	835.07.01 Steel Strain Poles.		
Revision:	Replace the second sentence of the second paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.		
Subsection:	835.07.01 Steel Strain Poles.		
Revision:	Replace number 7. after the second paragraph with the following: 7. Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.		
Subsection:	835.07.02 Mast Arm Poles.		
Revision:	Replace the second sentence of the fourth paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.		
Subsection:	835.07.02 Mast Arm Poles.		
Revision:	Replace number 7) after the fourth paragraph with the following: 7) Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.		
Subsection:	835.07.03 Anchor Bolts.		
Revision:	Add the following to the end of the paragraph: There shall be two steel templates (one can be used for the headed part of the anchor bolt when designed in this manner) provided per pole. Templates shall be contained within a 26.5 inch diameter. All templates shall be fully galvanized (ASTM A 153).		
Subsection:	835.16.05 Optical Units.		
Revision:	Replace the 3rd paragraph with the following: The list of certified products can be found on the following website: http://www.intertek.com .		
Subsection:	835.19.01 Pedestrian Detector Body.		
Revision:	Replace the first sentence with the following: Provide a four holed pole mounted aluminum rectangular housing that is compatible with the pedestrian detector.		
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE I FABRIC GEOTEXTILES FOR SLOPE PROTECTION AND CHANNEL LINING		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	494	ASTM D6241
	Permittivity (1/s)	0.7	ASTM D4491

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Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE II FABRIC GEOTEXTILES FOR UNDERDRAINS		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	210	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE III FABRIC GEOTEXTILES FOR SUBGRADE OR EMBANKMENT STABILIZATION		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	370	ASTM D6241
	Permittivity (1/s)	0.05	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE IV FABRIC GEOTEXTILES FOR EMBANKMENT DRAINAGE BLANKETS AND PAVEMENT EDGE DRAINS		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	309	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE V HIGH STRENGTH GEOTEXTILE FABRIC		
Revision:	Make the following changes to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	618	ASTM D6241
	Apparent Opening Size	U.S. #40 ⁽³⁾	ASTM D4751
	⁽³⁾ Maximum average roll value.		

SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

This Special Note will apply when indicated on the plans or in the proposal.

1.0 DESCRIPTION. Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

2.0 MATERIALS.

2.1 General. Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

2.2 Sign and Controls. All signs must:

- 1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
- 2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
- 3) Provide a controller consisting of:
 - a) Keyboard or keypad.
 - b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
 - c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
 - d) Logic circuitry to control the sequence of messages and flash rate.
- 4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
- 5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
- 6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
- 7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
- 8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
- 9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
- 10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
- 11) Provide a photocell control to provide automatic dimming.

- 12) Allow an on-off flashing sequence at an adjustable rate.
- 13) Provide a sight to aim the message.
- 14) Provide a LED display color of approximately 590 nm amber.
- 15) Provide a controller that is password protected.
- 16) Provide a security device that prevents unauthorized individuals from accessing the controller.
- 17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

/KEEP/RIGHT/⇒⇒⇒/	/MIN/SPEED/**MPH/
/KEEP/LEFT/⇐⇐⇐/	/ICY/BRIDGE/AHEAD/ /ONE
/LOOSE/GRAVEL/AHEAD/	LANE/BRIDGE/AHEAD/
/RD WORK/NEXT/**MILES/	/ROUGH/ROAD/AHEAD/
/TWO WAY/TRAFFIC/AHEAD/	/MERGING/TRAFFIC/AHEAD/
/PAINT/CREW/AHEAD/	/NEXT/***/MILES/
/REDUCE/SPEED/**MPH/	/HEAVY/TRAFFIC/AHEAD/
/BRIDGE/WORK/***() FT/	/SPEED/LIMIT/**MPH/
/MAX/SPEED/**MPH/	/BUMP/AHEAD/
/SURVEY/PARTY/AHEAD/	/TWO/WAY/TRAFFIC/

*Insert numerals as directed by the Engineer.
Add other messages during the project when required by the Engineer.

2.3 Power.

- 1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

3.0 CONSTRUCTION. Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

4.0 MEASUREMENT. The final quantity of Variable Message Sign will be

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the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

5.0 PAYMENT. The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

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SPECIAL NOTE FOR ROADBED STABILIZATION AT BRIDGE ENDS

This Special Note will apply where indicated on the plans or in the proposal. Section references herein are to the Department’s 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. Due to the wet and yielding embankments commonly encountered at bridge ends, undercut the existing roadbed within the limits the Contract specifies and backfill.

2.0 MATERIALS.

2.1 Geotextile Fabric. Furnish Type III fabric conforming to Section 843.

3.0 CONSTRUCTION. After removing the existing pavement and base, undercut the existing roadbed under the traffic lanes and shoulders as the Engineer directs. The minimum undercut shall be one foot, except undercut depth may be reduced where rock embankment constructed principally of limestone is encountered. Place geotextile fabric in the bottom and against the sides and ends of the undercut. The Department will not require a minimum lap between adjacent sheets of geotextile fabric for the longitudinal joint under the pavement centerline. Backfill the undercut with one or more of the following materials;

- 1) Crushed limestone size No. 1, 2, 23, or 57; or
- 2) Layered composition of several limestone sizes, with larger sizes on the bottom.

Use Dense Graded Aggregate (DGA), Crushed Stone Base (CSB), or Stabilized Aggregate Base (SAB) in the top 4 inches, and only in the top 4 inches, of the backfill.

Place geotextile fabric between the coarse backfill material and the 4-inch upper layer.

Compact the backfill material by “walking down” with equipment, or other methods the Engineer approves. See attached drawing for details of backfill placement and drainage.

Waste all removed materials, not used for purposes the Contract or Engineer specifies or permits, off the right-of-way at no expense to the Department.

4.0 MEASUREMENT.

4.1 Removing Pavement. The Department will measure the quantity in square yards. The Department will consider the pavement to include existing pavement, existing asphalt patching, and existing DGA base.

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4.2 Roadway Excavation. The Department will measure the quantity in cubic yards.

4.3 Backfilling Undercut. The Department will measure the quantity in cubic yards. The Department will not measure coarse aggregate for payment and will consider it incidental to this item of work.

4.4 Perforated Pipe. The Department will measure the quantity in linear feet.

4.5 Non-Perforated Pipe. The Department will measure the quantity in linear feet.

4.6 Geotextile Fabric, Type III. The Department will measure the quantity in square yards.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

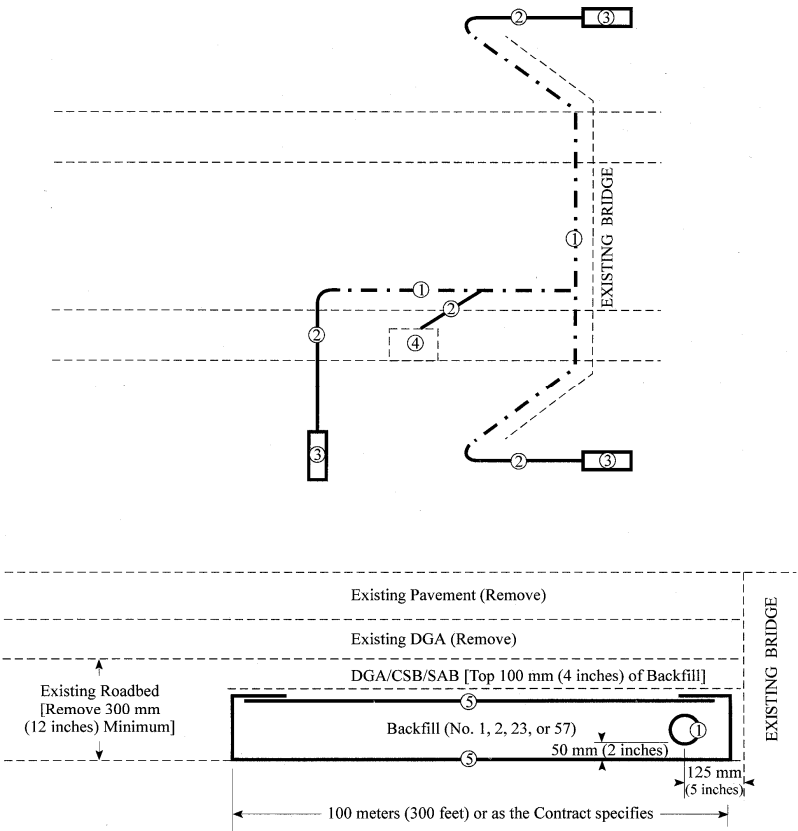
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02091	Removing Pavement	Square Yard
01000	Perforated Pipe - 4 inches	Linear Foot
01010	Non-Perforated Pipe, 4 inches	Linear Foot
02235	Backfilling Undercut	Cubic Yard
02598	Fabric - Geotextile Type III	Square Yard

The Department will consider payment as full compensation for all work required in this note.

June 15, 2012

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BRIDGE END DRAINAGE AND STABILIZATION
(DETAILS)



- NOTES**

Contrary to Section 705 of the Standard Specifications, use only coarse aggregate for trench backfill.

Slope all pipe to drain to the outside. Provide a 1:24 (1/2":1') or greater slope for the outlet pipe.

The Department may require additional transverse drains within the stabilization area.
- LEGEND**

 - ① 100-mm (4-inch) Perforated Pipe
 - ② 100-mm (4-inch) Non-perforated Pipe
 - ③ Perforated Pipe Headwall
 - ④ Existing Box Inlet
 - ⑤ Geotextile Fabric, Type III

SPECIAL NOTE FOR TURF REINFORCING MAT

1.0 DESCRIPTION. Install turf reinforcement mat at locations specified in the Contract or as the Engineer directs. Section references herein are to the Department's 2008 Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS.

2.1 Turf Reinforcement Mat (TRM). Use a Turf Reinforcement Mat defined as permanent rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh and/or other elements, processed into a three-dimensional matrix of sufficient thickness and from the Department's List of Approved Materials. Mats must be 100% UV stabilized materials. For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting exclusively. Ensure product labels clearly show the manufacturer or supplier name, style name, and roll number. Ensure labeling, shipment and storage follows ASTM D-4873. The Department will require manufacturer to provide TRMs that are machine constructed web of mechanically or melt bonded nondegradable fibers entangled to form a three dimensional matrix. The Department will require all long term performance property values in table below to be based on non degradable portion of the matting alone. Approved methods include polymer welding, thermal or polymer fusion, or placement of fibers between two high strength biaxially oriented nets mechanically bound by parallel stitching with polyolefin thread. Ensure that mats designated in the plans as Type 4 mats, are not to be manufactured from discontinuous or loosely held together by stitching or glued netting or composites. Type 4 mats shall be composed of geosynthetic matrix that exhibits a very high interlock and reinforcement capacities with both soil and root systems and with high tensile modulus. The Department will require manufacturer to use materials chemically and biologically inert to the natural soil environments conditions. Ensure the blanket is smolder resistant without the use of chemical additives. When stored, maintain the protective wrapping and elevate the mats off the ground to protect them from damage. The Department will not specify these materials for use in heavily acidic coal seam areas or other areas with soil problems that would severally limit vegetation growth.

- A) Dimensions. Ensure TRMs are furnished in strips with a minimum width of 4 feet and length of 50 feet.
- B) Weight. Ensure that all mat types have a minimum mass per unit area of 7 ounces per square yard according to ASTM D 6566.
- C) Performance Testing: The Department will require AASHTO's NTPEP index testing. The Department will also require the manufacturer to perform internal MARV testing at a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory for tensile strength, tensile elongation, mass per unit area, and thickness once every 24,000 yds of production or whatever rate is required to ensure 97.7% confidence under ASTM D4439& 4354. The Department will require Full scale testing for slope and channel applications shear stress shall be done under ASTM D 6459, ASTM D 6460-07 procedures.

2.2 Classifications

The basis for selection of the type of mat required will be based on the long term shear stress level of the mat of the channel in question or the degree of slope to protect and will be designated in the contract. The Type 4 mats are to be used at structural backfills protecting critical

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structures, utility cuts, areas where vehicles may be expected to traverse the mat, channels with large heavy drift, and where higher factors of safety, very steep slopes and/or durability concerns are needed as determined by project team and designer and will be specified in the plans by designer.

Turf Reinforcement Matting					
Properties ¹	Type 1	Type 2	Type 3	Type 4	Test Method
Minimum tensile Strength lbs/ft	125	150	175	3000 by 1500	ASTM D6818 ²
UV stability (minimum % tensile retention)	80	80	80	90	ASTM D4355 ³ (1000-hr exposure)
Minimum thickness (inches)	0.25	0.25	0.25	0.40	ASTM D6525
Slopes applications	2H:1V or flatter	1.5H:1V or flatter	1H:1V or flatter	1 H: 1V or greater	
Shear stress lbs/ft ² Channel applications	6.0 ⁴	8.0 ⁴	10.0 ⁴	12.0 ⁴	ASTM D6459 ASTM D6460-07

¹ For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting alone.

²Minimum Average Roll Values for tensile strength of sample material machine direction.

³Tensile Strength percentage retained after stated 1000 hr duration of exposure under ASTM D4355 testing. Based on nondegradable components exclusively.

⁴Maximum permissible shear design values based on short-term (0.5 hr) vegetated data obtained by full scale flume testing ASTM D6459, D6460-07. Based on nondegradable components exclusively. Testing will be done at Independent Hydraulics Facility such as Colorado State University hydraulics laboratory, Utah State University hydraulics laboratory, Texas Transportation Institute (TTI) hydraulics and erosion control laboratory.

2.3 Quality Assurance Sampling, Testing, and Acceptance

- A) Provide TRM listed on the Department's List of Approved Materials. Prior to inclusion on the LAM, the manufacturer of TRM must meet the physical and performance criteria as outlined in the specification and submit a Letter Certifying compliance of the product under the above ASTM testing procedures and including a copy of report from Full Scale Independent Hydraulics Facility that Fully Vegetated Shear Stress meets shear stress requirements tested under D6459 and D6460-07.
- B) Contractors will provide a Letter of Certification from Manufacturer stating the product name, manufacturer, and that the product MARV product unit testing results meets Department criteria. Provide Letters once per project and for each product.
- C) Acceptance shall be in accordance with ASTM D-4759 based on testing performed by a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory using Procedure A of ASTM D-4354.

Current mats meeting the above criteria are shown on the Department’s List of Approved Materials.

2.4 Fasteners. When the mat manufacturer does not specify a specific fastener, use steel wire U-shaped staples with a minimum diameter of 0.09 inches (11 gauge), a minimum width of one inch and a minimum length of 12 inches. Use a heavier gauge when working in rocky or clay soils and longer lengths in sandy soils as directed by Engineer or Manufacturer’s Representative. Provide staples with colored tops when requested by the Engineer.

3.0 CONSTRUCTION. When requested by the Engineer, provide a Manufacturer’s Representative on-site to oversee and approve the initial installation of the mat. When requested by the Engineer, provide a letter from the Manufacturer approving the installation. When there is a conflict between the Department’s criteria and the Manufacturer’s criteria, construct using the more restrictive. The Engineer and Manufacturer’s Representative must approve all alternate installation methods prior to execution. Construct according to the Manufacturer’s recommendations and the following as minimum installation technique:

3.1 Site Preparation. Grade areas to be treated with matting and compact. Remove large rocks, soil clods, vegetation, roots, and other sharp objects that could keep the mat from intimate contact with subgrade. Prepare seedbed by loosening the top 2 to 3 inch of soil.

3.2 Installation. Install mats according to Standard Drawing Sepias “Turf Mat Channel Installation” and “Turf Mat Slope Installation.” Install mats at the specified elevation and alignment. Anchor the mats with staples with a minimum length of 12 inches. Use longer anchors for installations in sandy, loose, or wet soils as directed by the Engineer or Manufacturer’s Representative. The mat should be in direct contact with the soil surface.

4.0 MEASUREMENT. The Department will measure the quantity of Turf Reinforcement Mat by the square yard of surface covered. The Department will not measure preparation of the bed, providing a Manufacturer’s Representative, topsoil, or seeding for payment and will consider them incidental to the Turf Reinforcement Mat. The Department will not measure any reworking of slopes or channels for payment as it is considered corrective work and incidental to the Turf Reinforcement Mat. Seeding and protection will be an incidental item.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
23274EN11F	Turf Reinforcement Mat 1	Square Yard
23275EN11F	Turf Reinforcement Mat 2	Square Yard
23276EN11F	Turf Reinforcement Mat 3	Square Yard
23277EN11F	Turf Reinforcement Mat 4	Square Yard

April 18, 2009

SPECIAL NOTE FOR BARCODE LABEL ON PERMANENT SIGNS

1.0 DESCRIPTION. Install barcode label on sheeting signs. Section references herein are to the Department’s 2012 Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS. The Department will provide the Contractor with a 2 inch x 1 inch foil barcode label for each permanent sheeting sign. A unique number will be assigned to each barcode label.

The Contractor shall contact the Operations and Pavement Management Branch in the Division of Maintenance at (502) 564-4556 to obtain the barcode labels.

3.0 CONSTRUCTION. Apply foil barcode label in the lower right quadrant of the sign back. Signs where the bottom edge is not parallel to the ground, the lowest corner of the sign shall serve as the location to place the barcode label. The barcode label shall be placed no less than one-inch and no more than three inches from any edge of the sign. The barcode must be placed so that the sign post does not cover the barcode label.

Barcodes shall be applied in an indoor setting with a minimum air temperature of 50°F or higher. Prior to application of the barcode label, the back of the sign must be clean and free of dust, oil, etc. If the sign is not clean, an alcohol swab shall be used to clean the area. The area must be allowed to dry prior to placement of the barcode label.

Data for each sign shall include the barcode number, MUTCD reference number, sheeting manufacturer, sheeting type, manufacture date, color of primary reflective surface, installation date, latitude and longitude using the North American Datum of 1983 (NAD83) or the State Plane Coordinates using an x and y ordinate of the installed location.

Data should be provided electronically on the TC 71-229 Sign Details Information and TC 71-230 Sign Assembly Information forms. The Contractor may choose to present the data in a different format provided that the information submitted to the Department is equivalent to the information required on the Department TC forms. The forms must be submitted in electronic format regardless of which type of form is used. The Department will not accept PDF or handwritten forms. These completed forms must be submitted to the Department prior to final inspection of the signs. The Department will not issue formal acceptance for the project until the TC 71-229 and TC-230 electronic forms are completed for all signs and sign assemblies on the project.

4.0 MEASUREMENT. The Department will measure all work required for the installation of the barcode label and all work associated with completion and submission of the sign inventory data (TC 71-229 and TC 71-230).

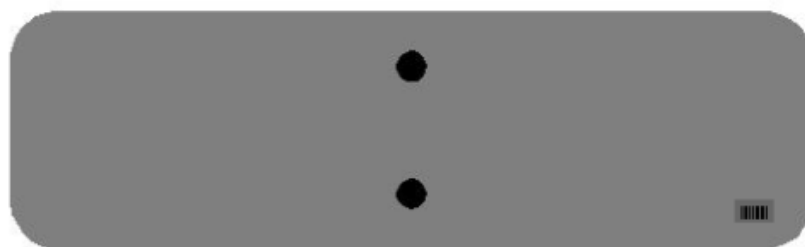
The installation of the permanent sign will be measured in accordance to Section 715.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

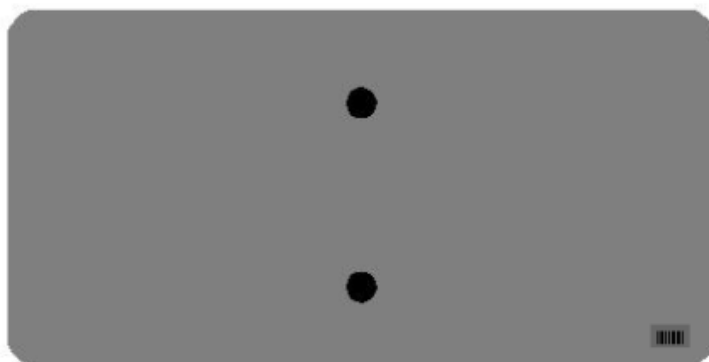
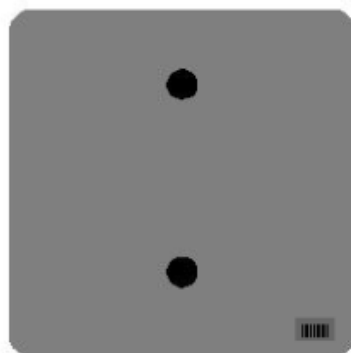
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24631EC	Barcode Sign Inventory	Each

The Department will not make payment for this item until all barcodes are installed and sign inventory is complete on every permanent sign installed on the project. The Department will make payment for installation of the permanent sign in accordance to Section 715. The Department will consider payment as full compensation for all work required under this special note.

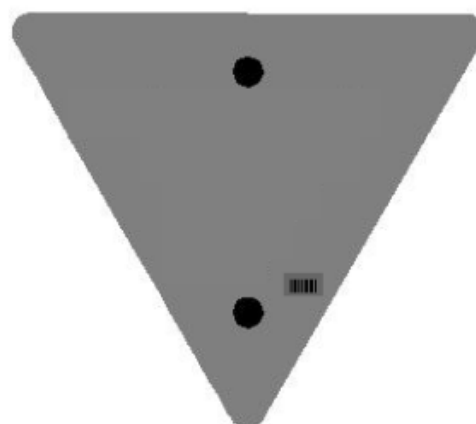
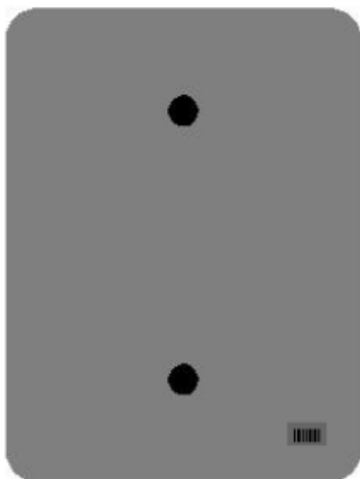
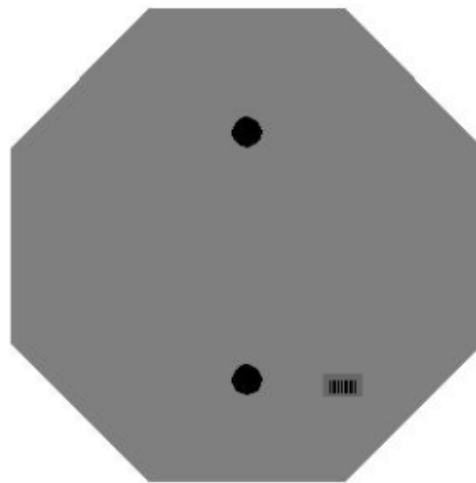
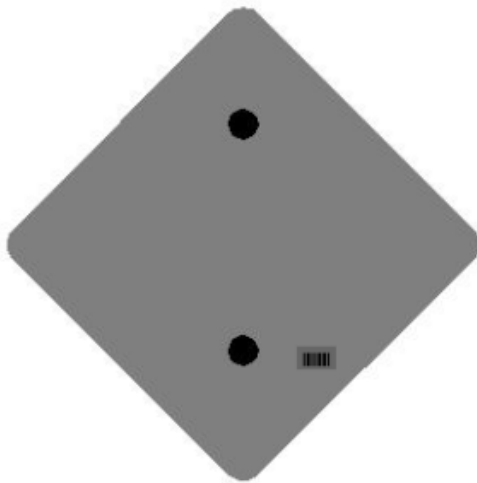
One Sign Post



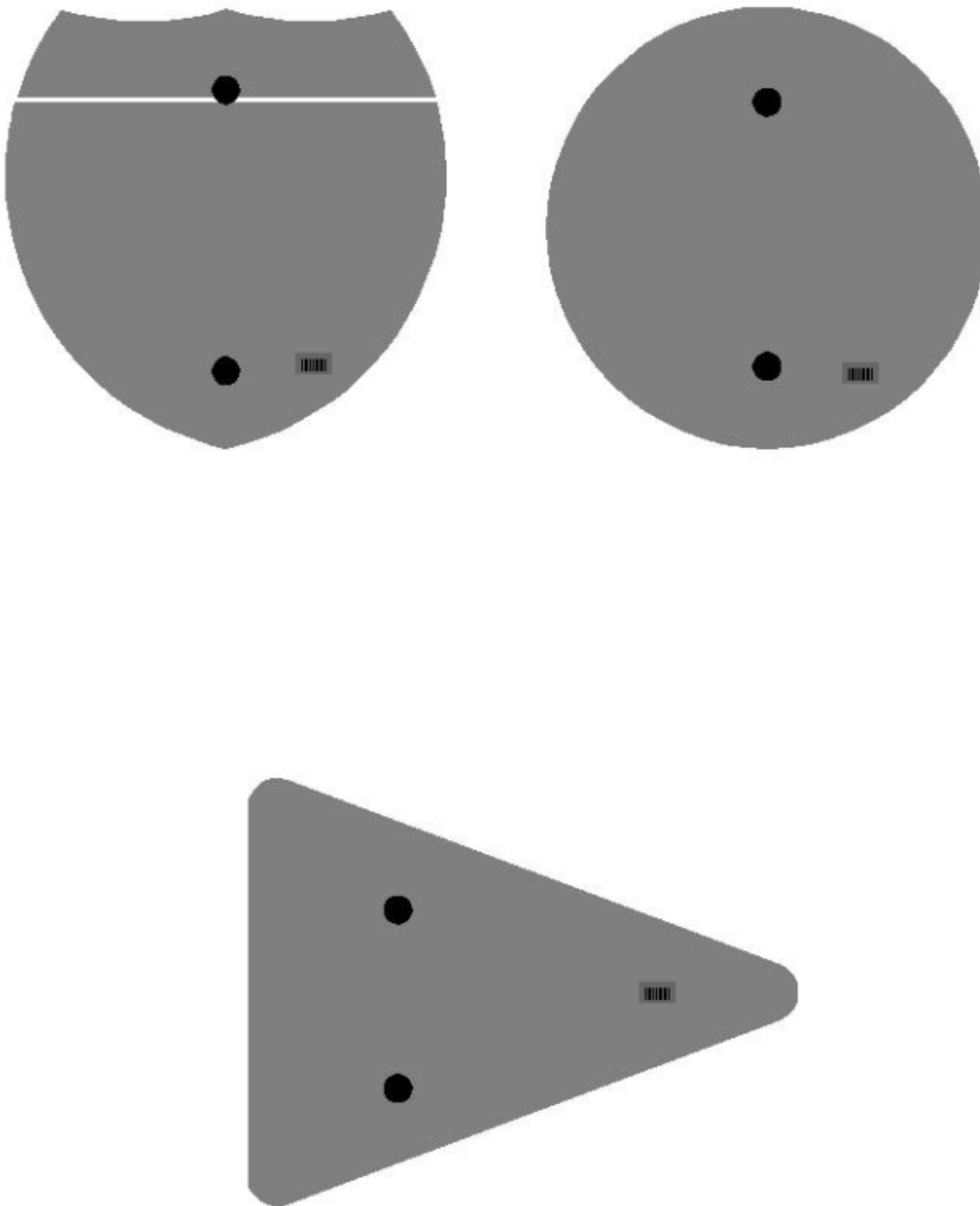
↑
2" Wide Post



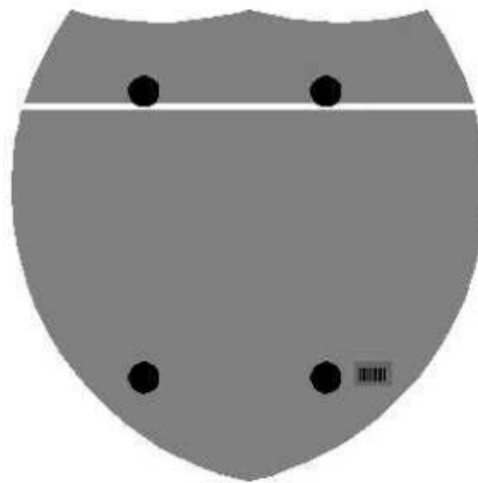
One Sign Post



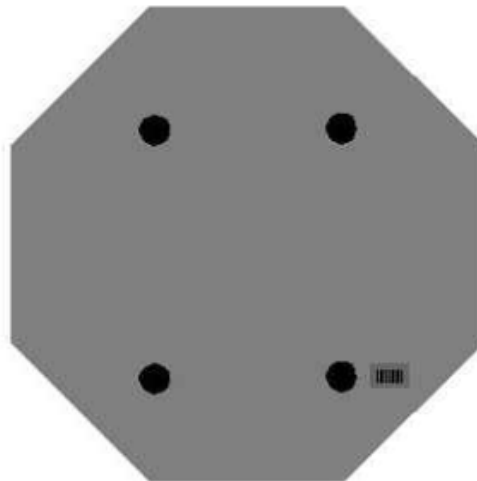
One Sign Post



Double Sign Post



Interstate
Shield



48" Stop

2 Post Signs



PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

- (3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.
- (4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

- a. Apprentices (programs of the USDOL).
- Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.
- The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

- 1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
- 2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

- 1. Instructions for Certification – First Tier Participants:**
 - a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
 - b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

- (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;
- (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and
- (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

- 1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
- 2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

- 1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- 2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
- 3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

**KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS**

**EMPLOYMENT REQUIREMENTS
RELATING TO
NONDISCRIMINATION OF EMPLOYEES
(APPLICABLE TO FEDERAL-AID SYSTEM CONTRACTS)**

**AN ACT OF THE KENTUCKY GENERAL ASSEMBLY
TO PREVENT DISCRIMINATION IN EMPLOYMENT**

**KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972**

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy). The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, disability or age (between forty and seventy), except that such notice or advertisement may indicate a preference, limitation, or specification based on religion, or national origin when religion, or national origin is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual because of his race, color, religion, national origin, sex, disability or age (between forty and seventy), in admission to, or employment in any program established to

provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

REVISED: 12-3-92

Standard Title VI/Non-Discrimination Assurances

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, **Federal Highway Administration**, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor’s obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the **Federal Highway Administration** to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the **Federal Highway Administration**, as appropriate, and will set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of a contractor’s noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the **Federal Highway Administration** may determine to be appropriate, including, but not limited to:
 - a. withholding payments to the contractor under the contract until the contractor complies; and/or
 - b. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the **Federal Highway Administration** may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

Standard Title VI/Non-Discrimination Statutes and Authorities

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 -- 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 *et seq.*).

EXECUTIVE BRANCH CODE OF ETHICS

In the 1992 regular legislative session, the General Assembly passed and Governor Brereton Jones signed Senate Bill 63 (codified as KRS 11A), the Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (6) provides:

No present or former public servant shall, within six (6) months of following termination of his office or employment, accept employment, compensation or other economic benefit from any person or business that contracts or does business with the state in matters in which he was directly involved during his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved in state government. This subsection shall not prohibit the performance of ministerial functions, including, but not limited to, filing tax returns, filing applications for permits or licenses, or filing incorporation papers.

KRS 11A.040 (8) states:

A former public servant shall not represent a person in a matter before a state agency in which the former public servant was directly involved, for a period of one (1) year after the latter of:

- a) The date of leaving office or termination of employment; or
- b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not as a way to obtain private benefits.

If you have worked for the executive branch of state government within the past six months, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, Room 136, Capitol Building, 700 Capitol Avenue, Frankfort, Kentucky 40601; telephone (502) 564-7954.

General Decision Number: KY150101 09/18/2015 KY101

Superseded General Decision Number: KY20140101

State: Kentucky

Construction Type: Highway

Counties: Boone, Campbell, Kenton and Pendleton Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015
1	01/23/2015
2	05/01/2015
3	06/05/2015
4	06/19/2015
5	09/11/2015
6	09/18/2015

BRKY0002-005 06/01/2014

	Rates	Fringes
BRICKLAYER.....	\$ 26.50	11.17

BROH0001-005 06/01/2008

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 25.75	8.60

CARP0698-001 05/01/2014

BOONE, CAMPBELL, KENTON & PENDLETON COUNTIES:

	Rates	Fringes
Carpenter & Piledrivermen.....	\$ 27.27	14.59

Diver.....\$ 40.58 9.69

ELEC0212-007 06/01/2015

	Rates	Fringes
ELECTRICIAN.....	\$ 27.03	17.02

ELEC0212-013 12/01/2014

	Rates	Fringes
Sound & Communication Technician.....	\$ 22.75	10.08

* ENGI0018-013 05/01/2015

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 33.34	14.25
GROUP 2.....	\$ 33.22	14.25
GROUP 3.....	\$ 32.18	14.25
GROUP 4.....	\$ 31.00	14.24
GROUP 5.....	\$ 25.54	14.25
GROUP 6.....	\$ 33.59	14.25
GROUP 7.....	\$ 33.84	14.25

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Air Compressor on Steel Erection; Barrier Moving Machine; Boiler Operator on Compressor or Generator when mounted on a Rig; Cableway; Combination Concrete Mixer & Tower; Concrete Plant (over 4 yd. Capacity); Concrete Pump; Crane (All Types, Including Boom Truck, Cherry Picker); Crane-Compact, Track or Rubber over 4,000 lbs. capacity; Cranes-Self Erecting, Stationary, Track or Truck (All Configurations); Derrick; Dragline; Dredge (Dipper, Clam or Suction); Elevating Grader or Euclid Loader; Floating Equipment (All Types); Gradall; Helicopter Crew (Operator-Hoist or Winch); Hoe (all types); Hoisting Engine on Shaft or Tunnel Work; Hydraulic Gantry (Lifting System); Industrial-Type Tractor; Jet Engine Dryer (D8 or D9) Diesel Tractor; Locomotive (Standard Gauge); Maintenance Operator Class A; Mixer, Paving (Single or Double Drum); Mucking Machine; Multiple Scraper; Piledriving Machine (All Types); Power Shovel; Prentice Loader; Quad 9 (Double Pusher); Rail Tamper (with auto lifting & aligning device); Refrigerating Machine (Freezer Operation); Rotary Drill, on Caisson work; Rough Terrain Fork Lift with Winch/Hoist; Side-Boom; Slip-Form Paver; Tower Derrick; Tree Shredder; Trench Machine (Over 24" wide); Truck Mounted Concrete Pump; Tug Boat; Tunnel Machine and/or Mining Machine; & Wheel Excavator

GROUP 2 - Asphalt Paver; Automatic Subgrader Machine, Self-Propelled (CMI Type); Bobcat Type and/or Skid Steer Loader with Hoe Attachment Greater than 7,000 lbs.; Boring Machine More than 48"; Bulldozer; Endloader; Hydro Milling Machine; Horizontal Directional Drill (over 500,000 ft.

lbs. thrust); Kolman-type Loader (production type-Dirt);
Lead Greaseman; Lighting & Traffic Signal Installation
Equipment (includes all groups or classifications);
Material Transfer Equipment (Shuttle Buggy) Asphalt;
Pettibone-Rail Equipment; Power Grader; Power Scraper; Push
Cat; Rotomill (all), Grinders & Planers of All types;
Trench Machine (24" wide & under); & Vermeer type Concrete
Saw

GROUP 3 - A-Frame; Air Compressor on Tunnel Work (low
pressure); Asphalt Plant Engineer; Bobcat-type and/or Skid
Steer Loader with or without Attachments; Highway Drills
(all types); Locomotive (narrow gauge); Material
Hoist/Elevator; Mixer, Concrete (more than one bag
capacity); Mixer, one bag capacity (Side Loader); Power
Boiler (Over 15 lbs. Pressure) Pump Operator installing &
operating Well Points; Pump (4" & over discharge); Roller,
Asphalt; Rotovator (lime soil stabilizer); Switch & Tie
Tampers (without lifting & aligning device); Utility
Operator (Small equipment); & Welding Machines

GROUP 4 - Backfiller; Ballast Re-locator; Bars, Joint & Mesh
Installing Machine; Batch Plant; Boring Machine Operator
(48" or less); Bull Floats; Burlap & Curing Machine;
Concrete Plant (capacity 4 yd. & under); Concrete Saw
(Multiple); Conveyor (Highway); Crusher; Deckhand;
Farm-type Tractor with attachments (highway) except
Masonry); Finishing Machine; Fireperson, Floating Equipment
(all types); Fork Lift (highway); Form Trencher; Hydro
Hammer; Hydro Seeder; Pavement Breaker; Plant Mixer; Post
Driver; Post Hole Digger (Power Auger); Power Brush Burner;
Power Form Handling Equipment; Road Widening Trencher;
Roller (Brick, Grade & Macadam); Self-Propelled Power
Spreader; Self-Propelled Power Subgrader; Steam Fireperson;
Tractor (Pulling Sheepfoot, Roller or Grader); & Vibratory
Compactor with Integral Power

GROUP 5 - Compressor (Portable, Sewer, Heavy & Highway); Drum
Fireperson (Asphalt); Generator; Masonry Fork Lift;
Inboard-Outboard Motor Boat Launch; Masonry Fork Lift; Oil
Heater (asphalt plant); Oiler; Power Driven Heater; Power
Sweeper & Scrubber; Pump (under 4" discharge);
Signalperson; Tire Repairperson; & VAC/ALLS

GROUP 6 - Master Mechanic & Boom from 150 to 180

GROUP 7 - Boom from 180 and over

IRON0044-008 06/01/2015		
	Rates	Fringes
Ironworkers:		
Fence Erector.....	\$ 23.76	19.15
Structural.....	\$ 26.40	19.15

IRON0372-004 06/15/2015		
	Rates	Fringes

IRONWORKER, REINFORCING.....\$ 27.0019.00

LABO0189-004 07/01/2014

PENDLETON COUNTY:

	Rates	Fringes
LABORER		
GROUP 1.....	\$ 21.80	11.96
GROUP 2.....	\$ 22.05	11.96
GROUP 3.....	\$ 22.10	11.96
GROUP 4.....	\$ 22.70	11.96

LABORERS CLASSIFICATIONS

- GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup
- GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller
- GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster
- GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Driller (All Types); Powderman & Blaster; Troxler & Concrete Tester if Laborer is Utilized

LABO0265-009 05/01/2015

BOONE, CAMPBELL & KENTON COUNTIES:

	Rates	Fringes
LABORER		
GROUP 1.....	\$ 28.72	9.85
GROUP 2.....	\$ 28.89	9.85
GROUP 3.....	\$ 29.22	9.85
GROUP 4.....	\$ 29.67	9.85

LABORER CLASSIFICATIONS

GROUP 1 - Asphalt Laborer; Carpenter Tender; Concrete Curing Applicator; Dump Man (Batch Truck); Guardrail and Fence Installer; Joint Setter; Laborer (Construction); Landscape Laborer; Highway Lighting Worker; Signalization Worker; Mesh Handlers & Placer; Right-of-way Laborer; Riprap Laborer & Grouter; Scaffold Erector; Seal Coating; Surface Treatment or Road Mix Laborer; Sign Installer; Slurry Seal; Utility Man; Bridge Man; Handyman; Waterproofing Laborer; Flagperson; Hazardous Waste (level D); Diver Tender; Zone Person & Traffic Control

GROUP 2 - Skid Steer; Asphalt Raker; Concrete Puddler; Kettle Man (Pipeline); Machine Driven Tools (Gas, Electric, Air); Mason Tender; Brick Paver; Mortar Mixer; Power Buggy or Power Wheelbarrow; Sheeting & Shoring Man; Surface Grinder Man; Plastic Fusing Machine Operator; Pug Mill Operator; & Vacuum Devices (wet or dry); Rodding Machine Operator; Diver; Screwman or Paver; Screed Person; Water Blast, Hand Held Wand; Pumps 4" & Under (Gas, Air or Electric) & Hazardous Waste (level C); Air Track and Wagon Drill; Bottom Person; Cofferdam (below 25 ft. deep); Concrete Saw Person; Cutting with Burning Torch; Form Setter; Hand Spiker (Railroad); Pipelayer; Tunnel Laborer (without air) & Caisson; Underground Person (working in Sewer and Waterline, Cleaning, Repairing & Reconditioning); Sandblaster Nozzle Person; & Hazardous Waste (level B)

GROUP 3 - Blaster; Mucker; Powder Person; Top Lander; Wrencher (Mechanical Joints & Utility Pipeline); Yarner; Hazardous Waste (level A); Concrete Specialist; Concrete Crew in Tunnels (With Air-pressurized - \$1.00 premium); Curb Setter & Cutter; Grade Checker; Utility Pipeline Tapper; Waterline; and Caulker

GROUP 4 - Miner; & Gunite Nozzle Person

TUNNEL LABORER WITH AIR-PRESSURIZED ADD \$1.00 TO BASE RATE

SIGNAL PERSON WILL RECEIVE THE RATE EQUAL TO THE RATE PAID THE LABORER CLASSIFICATION FOR WHICH HE OR SHE IS SIGNALING.

PAIN0012-016 05/01/2015

	Rates	Fringes
PAINTER		
Bridge.....	\$ 24.39	9.06
Bridge Equipment Tender		

and Containment Builder.....	\$ 20.73	9.06
Brush & Roller.....	\$ 23.39	9.06
Sandblasting & Water		
Blasting.....	\$ 24.14	9.06
Spray.....	\$ 23.89	9.06

PLUM0392-008 06/01/2014

	Rates	Fringes
PLUMBER.....	\$ 29.80	17.79

SUKY2010-161 02/05/1996

	Rates	Fringes
Truck drivers:		
GROUP 1.....	\$ 15.85	4.60
GROUP 2.....	\$ 16.29	4.60

TRUCK DRIVER CLASSIFICATIONS

GROUP 1 - Driver

GROUP 2 - Euclid Wagon; End Dump; Lowboy; Heavy Duty
Equipment; Tractor-Trailer Combination; & Drag

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of "identifiers" that indicate whether the particular
rate is a union rate (current union negotiated rate for local),
a survey rate (weighted average rate) or a union average rate
(weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed
in dotted lines beginning with characters other than "SU" or
"UAVG" denotes that the union classification and rate were
prevailing for that classification in the survey. Example:
PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of

the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination

- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

These rates are listed pursuant to the Kentucky Determination No. CR-15-IV-HWY dated July 20, 2015.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

Apprentices or trainees shall be permitted to work as such subject to Administrative Regulations adopted by the Commissioner of Workplace Standards. Copies of these regulations will be furnished upon request from any interested person.

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.

OVERTIME:

Overtime is to be paid after an employee works eight (8) hours a day or forty (40) hours a week, whichever gives the employee the greater wages. At least time and one-half the base rate is required for all overtime. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. Wage violations or questions should be directed to the designated Engineer or the undersigned.

Director
Division of Construction Procurement
Frankfort, Kentucky 40622
502-564-3500

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(Executive Order 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

GOALS FOR MINORITY PARTICIPATION IN EACH TRADE	GOALS FOR FEMALE PARTICIPATION IN EACH TRADE
11.0%	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4, 3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of \$10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. The notification shall be mailed to:

**Evelyn Teague, Regional Director
Office of Federal Contract Compliance Programs
61 Forsyth Street, SW, Suite 7B75
Atlanta, Georgia 30303-8609**

4. As used in this Notice, and in the contract resulting from this solicitation, the "**covered area**" is Campbell County.

PART IV

INSURANCE

INSURANCE

The Contractor shall procure and maintain the following insurance in addition to the insurance required by law:

- 1) Commercial General Liability-Occurrence form – not less than \$2,000,000 General aggregate, \$2,000,000 Products & Completed Aggregate, \$1,000,000 Personal & Advertising, \$1,000,000 each occurrence.
- 2) Automobile Liability- \$1,000,000 per accident
- 3) Employers Liability:
 - a) \$100,000 Each Accident Bodily Injury
 - b) \$500,000 Policy limit Bodily Injury by Disease
 - c) \$100,000 Each Employee Bodily Injury by Disease
- 4) The insurance required above must be evidenced by a Certificate of Insurance and this Certificate of Insurance must contain one of the following statements:
 - a) "policy contains no deductible clauses."
 - b) "policy contains _____ (amount) deductible property damage clause but company will pay claim and collect the deductible from the insured."
- 5) KENTUCKY WORKMEN'S COMPENSATION INSURANCE. The contractor shall furnish evidence of coverage of all his employees or give evidence of self-insurance by submitting a copy of a certificate issued by the Workmen's Compensation Board.

The cost of insurance is incidental to all contract items. All subcontractors must meet the same minimum insurance requirements.

PART V

BID ITEMS

Report Date 11/18/15

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	14,985.00	TON		\$	
0020	00013		LIME STABILIZED ROADBED	22,223.00	SQYD		\$	
0030	00014		LIME	438.00	TON		\$	
0040	00018		DRAINAGE BLANKET-TYPE II-ASPH	8,078.00	TON		\$	
0050	00100		ASPHALT SEAL AGGREGATE	14.70	TON		\$	
0060	00103		ASPHALT SEAL COAT	1.76	TON		\$	
0070	00190		LEVELING & WEDGING PG64-22	284.00	TON		\$	
0080	00221		CL2 ASPH BASE 0.75D PG64-22	13,063.00	TON		\$	
0090	00307		CL2 ASPH SURF 0.38B PG64-22	2,921.00	TON		\$	
0100	00358		ASPHALT CURING SEAL	23.00	TON		\$	
0110	02070		JPC PAVEMENT-12 IN	546.00	SQYD		\$	
0120	02101		CEM CONC ENT PAVEMENT-8 IN	535.00	SQYD		\$	
0130	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0140	02677		ASPHALT PAVE MILLING & TEXTURING	96.00	TON		\$	
0150	02702		SAND FOR BLOTTER	56.00	TON		\$	
0160	23379EC		STAMPED CONCRETE	546.00	SQYD		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0170	00078		CRUSHED AGGREGATE SIZE NO 2	36,550.00	TON		\$	
0180	01000		PERFORATED PIPE-4 IN	16,951.00	LF		\$	
0190	01001		PERFORATED PIPE-6 IN	936.00	LF		\$	
0200	01010		NON-PERFORATED PIPE-4 IN	275.00	LF		\$	
0210	01011		NON-PERFORATED PIPE-6 IN	60.00	LF		\$	
0220	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.00	LS		\$	
0230	01020		PERF PIPE HEADWALL TY 1-4 IN	5.00	EACH		\$	
0240	01021		PERF PIPE HEADWALL TY 1-6 IN	1.00	EACH		\$	
0250	01028		PERF PIPE HEADWALL TY 3-4 IN	3.00	EACH		\$	
0260	01033		PERF PIPE HEADWALL TY 4-6 IN	2.00	EACH		\$	
0270	01310		REMOVE PIPE	1,090.00	LF		\$	
0280	01810		STANDARD CURB AND GUTTER	15,289.00	LF		\$	
0290	01825		ISLAND CURB AND GUTTER	5,329.00	LF		\$	
0300	01830		STANDARD INTEGRAL CURB	667.00	LF		\$	
0310	01875		STANDARD HEADER CURB	220.00	LF		\$	
0320	01891		ISLAND HEADER CURB TYPE 2	282.00	LF		\$	
0330	01937		MOUNTABLE MEDIAN TYPE 2	35.00	SQYD		\$	
0340	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	32.00	EACH		\$	
0350	02014		BARRICADE-TYPE III	10.00	EACH		\$	
0360	02084		JPC PAVEMENT-8 IN	87.00	SQYD		\$	
0370	02091		REMOVE PAVEMENT	875.00	SQYD		\$	
0380	02157		PAVED DITCH TYPE 1	170.00	SQYD		\$	
0390	02159		TEMP DITCH	20,060.00	LF		\$	
0400	02200		ROADWAY EXCAVATION	516,665.00	CUYD		\$	
0410	02223		GRANULAR EMBANKMENT	2,780.00	CUYD		\$	
0420	02242		WATER	2,000.00	MGAL		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0430	02262		FENCE-WOVEN WIRE TYPE 1	488.00	LF		\$	
0440	02268		REMOVE & REPLACE FENCE	1,135.00	LF		\$	
0450	02274		FENCE-6 FT CHAIN LINK	133.00	LF		\$	
0460	02351		GUARDRAIL-STEEL W BEAM-S FACE	1,337.50	LF		\$	
0470	02360		GUARDRAIL TERMINAL SECTION NO 1	2.00	EACH		\$	
0480	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	2.00	EACH		\$	
0490	02367		GUARDRAIL END TREATMENT TYPE 1	1.00	EACH		\$	
0500	02369		GUARDRAIL END TREATMENT TYPE 2A	2.00	EACH		\$	
0510	02381		REMOVE GUARDRAIL	1,455.00	LF		\$	
0520	02429		RIGHT-OF-WAY MONUMENT TYPE 1	34.00	EACH		\$	
0530	02432		WITNESS POST	34.00	EACH		\$	
0540	02483		CHANNEL LINING CLASS II	1,578.00	TON		\$	
0550	02484		CHANNEL LINING CLASS III	903.00	TON		\$	
0560	02545		CLEARING AND GRUBBING 56 ACRES	1.00	LS		\$	
0570	02551		CONCRETE-CLASS A FOR STEPS	13.10	CUYD		\$	
0580	02585		EDGE KEY	224.00	LF		\$	
0590	02596		FABRIC-GEOTEXTILE TYPE I	150.00	SQYD		\$	
0600	02599		FABRIC-GEOTEXTILE TYPE IV	62,110.00	SQYD		\$	
0610	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	27,372.00	SQYD	\$2.00	\$	\$54,744.00
0620	02611		HANDRAIL-TYPE A-1	1,856.00	LF		\$	
0630	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0640	02651		DIVERSIONS (BY-PASS DETOURS)	1.00	LS		\$	
0650	02671		PORTABLE CHANGEABLE MESSAGE SIGN	6.00	EACH		\$	
0660	02673		PRECAST VEHICLE STOP	175.00	LF		\$	
0670	02690		SAFELOADING	19.00	CUYD		\$	
0680	02701		TEMP SILT FENCE	20,060.00	LF		\$	
0690	02703		SILT TRAP TYPE A	10.00	EACH		\$	
0700	02704		SILT TRAP TYPE B	46.00	EACH		\$	
0710	02705		SILT TRAP TYPE C	8.00	EACH		\$	
0720	02706		CLEAN SILT TRAP TYPE A	20.00	EACH		\$	
0730	02707		CLEAN SILT TRAP TYPE B	92.00	EACH		\$	
0740	02708		CLEAN SILT TRAP TYPE C	16.00	EACH		\$	
0750	02720		SIDEWALK-4 IN CONCRETE	6,831.00	SQYD		\$	
0760	02726		STAKING	1.00	LS		\$	
0770	02731		REMOVE STRUCTURE	1.00	LS		\$	
0780	03385		PVC PIPE-6 IN	1,430.00	LF		\$	
0790	05950		EROSION CONTROL BLANKET	6,039.00	SQYD		\$	
0800	05952		TEMP MULCH	239,800.00	SQYD		\$	
0810	05953		TEMP SEEDING AND PROTECTION	239,800.00	SQYD		\$	
0820	05963		INITIAL FERTILIZER	11.40	TON		\$	
0830	05964		20-10-10 FERTILIZER	11.40	TON		\$	
0840	05985		SEEDING AND PROTECTION	195,224.00	SQYD		\$	
0850	05989		SPECIAL SEEDING CROWN VETCH	44,591.00	SQYD		\$	
0860	05990		SODDING	18,336.00	SQYD		\$	
0870	05992		AGRICULTURAL LIMESTONE	133.00	TON		\$	
0880	06406		SBM ALUM SHEET SIGNS .080 IN	748.00	SQFT		\$	
0890	06410		STEEL POST TYPE 1	1,332.00	LF		\$	
0900	06510		PAVE STRIPING-TEMP PAINT-4 IN	38,700.00	LF		\$	
0910	06514		PAVE STRIPING-PERM PAINT-4 IN	16,720.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0920	06550		PAVE STRIPING-TEMP REM TAPE-W	3,100.00	LF		\$	
0930	06551		PAVE STRIPING-TEMP REM TAPE-Y	3,700.00	LF		\$	
0940	06566		PAVE MARKING-THERMO X-WALK-12 IN	560.00	LF		\$	
0950	06568		PAVE MARKING-THERMO STOP BAR-24IN	51.00	LF		\$	
0960	06570		PAVE MARKING-PAINT CROSS-HATCH	14,927.00	SQFT		\$	
0970	06573		PAVE MARKING-THERMO STR ARROW	1.00	EACH		\$	
0980	06574		PAVE MARKING-THERMO CURV ARROW	22.00	EACH		\$	
0990	06591		PAVEMENT MARKER TYPE V-BY	89.00	EACH		\$	
1000	10020NS		FUEL ADJUSTMENT	202,769.00	DOLL	\$1.00	\$	\$202,769.00
1010	10030NS		ASPHALT ADJUSTMENT	63,601.00	DOLL	\$1.00	\$	\$63,601.00
1020	20206EC		PAVE MARK HANDICAP SYMBOL	2.00	EACH		\$	
1030	20550ND		SAWCUT PAVEMENT	1,184.00	LF		\$	
1040	20782NS714		PAVE MARKING THERMO-BIKE	8.00	EACH		\$	
1050	21476ED		SNOW FENCE	20,020.00	LF		\$	
1060	22520EN		PAVE MARKING-THERMO YIELD BAR-36 IN	149.00	LF		\$	
1070	22692NS714		PAVEMENT MARKING-THERMO LETTERS	45.00	EACH		\$	
1080	23158ES505		DETECTABLE WARNINGS	380.00	SQFT		\$	
1090	23274EN11F		TURF REINFORCEMENT MAT 1	4,453.00	SQYD		\$	
1100	23791EC		PAVE STRIPING-CHEVRON MARKINGS	1,587.00	SQFT		\$	
1110	24124EC		PVC CONDUIT-2 IN-SCHEDULE 40	9,600.00	LF		\$	
1120	24386EC		PAVE MARKING THERMO-BIKE LANE ARROW	8.00	EACH		\$	
1130	24631EC		BARCODE SIGN INVENTORY	153.00	EACH		\$	
1140	24801EC		IMPERMEABLE DETENTION BASIN LINING 24801EC - IMPERMEABLE DETENTION BASIN LINING	16,420.00	SQYD		\$	
1150	24814EC		PIPELINE INSPECTION	7,768.00	LF		\$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1160	00441		ENTRANCE PIPE-18 IN	87.00	LF		\$	
1170	00466		CULVERT PIPE-30 IN	104.00	LF		\$	
1180	00520		STORM SEWER PIPE-12 IN	177.00	LF		\$	
1190	00521		STORM SEWER PIPE-15 IN	685.00	LF		\$	
1200	00522		STORM SEWER PIPE-18 IN	4,797.00	LF		\$	
1210	00524		STORM SEWER PIPE-24 IN	1,105.00	LF		\$	
1220	00529		STORM SEWER PIPE-42 IN	291.00	LF		\$	
1230	00530		STORM SEWER PIPE-48 IN	522.00	LF		\$	
1240	01200		PIPE CULVERT HEADWALL-12 IN	2.00	EACH		\$	
1250	01202		PIPE CULVERT HEADWALL-15 IN	2.00	EACH		\$	
1260	01204		PIPE CULVERT HEADWALL-18 IN	8.00	EACH		\$	
1270	01208		PIPE CULVERT HEADWALL-24 IN	7.00	EACH		\$	
1280	01210		PIPE CULVERT HEADWALL-30 IN	2.00	EACH		\$	
1290	01216		PIPE CULVERT HEADWALL-48 IN	2.00	EACH		\$	
1300	01310		REMOVE PIPE	26.00	LF		\$	
1310	01428		SLOPED BOX OUTLET TYPE 1-12 IN	1.00	EACH		\$	
1320	01433		SLOPED BOX OUTLET TYPE 1-18 IN	2.00	EACH		\$	
1330	01456		CURB BOX INLET TYPE A	47.00	EACH		\$	
1340	01496		DROP BOX INLET TYPE 3	7.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1350	01499		DROP BOX INLET TYPE 4	1.00	EACH		\$	
1360	01538		DROP BOX INLET TYPE 7	1.00	EACH		\$	
1370	01544		DROP BOX INLET TYPE 11	1.00	EACH		\$	
1380	01559		DROP BOX INLET TYPE 13G	16.00	EACH		\$	
1390	01568		DROP BOX INLET TYPE 13S	4.00	EACH		\$	
1400	01642		JUNCTION BOX-18 IN	1.00	EACH		\$	
1410	01756		MANHOLE TYPE A	10.00	EACH		\$	
1420	01767		MANHOLE TYPE C	4.00	EACH		\$	
1430	23644EC		DROP BOX INLET TY 3-SAG	3.00	EACH		\$	
1440	24842EC		OVERFLOW STRUCTURE	1.00	EACH		\$	

Section: 0004 - SEWER

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1450	15000		S BYPASS PUMPING	3.00	EACH		\$	
1460	15010		S CONCRETE PIPE ANCHOR	2.00	EACH		\$	
1470	15018		S ENCASEMENT STEEL BORED RANGE 5	51.00	LF		\$	
1480	15092		S MANHOLE	4.00	EACH		\$	
1490	15093		S MANHOLE ABANDON/REMOVE	3.00	EACH		\$	
1500	15095		S MANHOLE CASTING STANDARD	1.00	EACH		\$	
1510	15101		S MANHOLE WITH DROP	2.00	EACH		\$	
1520	15104		S PIPE DUCTILE IRON 08 INCH	199.00	LF		\$	
1530	15106		S PIPE DUCTILE IRON 12 INCH	251.00	LF		\$	
1540	15112		S PIPE PVC 08 INCH	300.00	LF		\$	

Section: 0005 - LIGHTING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1550	04740		POLE BASE	27.00	EACH		\$	
1560	04820		TRENCHING AND BACKFILLING	4,280.00	LF		\$	
1570	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	17.00	EACH		\$	
1580	24121EC		HDPE CONDUIT-2 IN-SCHEDULE 80	1,060.00	LF		\$	
1590	24122EC		TRANSFORMER PAD	2.00	CUYD		\$	
1600	24124EC		PVC CONDUIT-2 IN-SCHEDULE 40	3,300.00	LF		\$	

Section: 0006 - WATERLINE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1610	14001		W AIR RELEASE VALVE 3/4 INCH	1.00	EACH		\$	
1620	14019		W FIRE HYDRANT ASSEMBLY	5.00	EACH		\$	
1630	14021		W FIRE HYDRANT REMOVE	1.00	EACH		\$	
1640	14023		W FLUSHING ASSEMBLY	1.00	EACH		\$	
1650	14031		W METER VAULT	1.00	EACH		\$	
1660	14036		W PIPE DUCTILE IRON 06 INCH	636.00	LF		\$	
1670	14037		W PIPE DUCTILE IRON 08 INCH	331.00	LF		\$	
1680	14039		W PIPE DUCTILE IRON 12 INCH	2,473.00	LF		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1690	14050		W PIPE DCTL IRON RSTRND JOINT 12 IN	246.00	LF		\$	
1700	14074		W PLUG EXISTING MAIN	1.00	EACH		\$	
1710	14094		W TIE-IN 06 INCH	1.00	EACH		\$	
1720	14095		W TIE-IN 08 INCH	2.00	EACH		\$	
1730	14097		W TIE-IN 12 INCH	4.00	EACH		\$	
1740	14106		W VALVE 08 INCH	1.00	EACH		\$	
1750	14108		W VALVE 12 INCH	11.00	EACH		\$	
1760	14112		W VALVE ANCHOR EXISTING	1.00	EACH		\$	

Section: 0007 - MOBILIZATION AND/OR DEMOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1770	02568		MOBILIZATION	1.00	LS		\$	
1780	02569		DEMOBILIZATION	1.00	LS		\$	